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Railway Age

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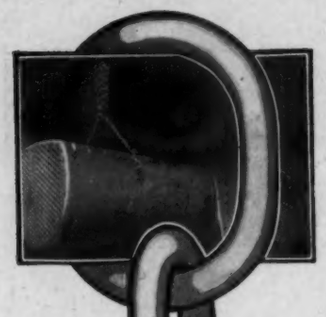

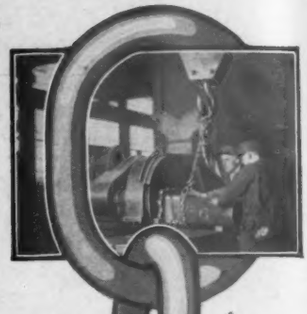

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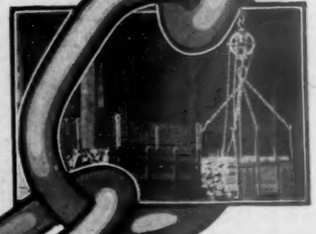

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EDITORIAL

Railway Age

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Undermaintenance has been the plaint of the railroads for the last five years. It comprises a primary basis for claims against the Railroad Administration and is the note of caution often heard of late in the analysis of railway operating results. Therefore, to hazard the opinion that some lines are being overmaintained is to invite the skepticism of the practical railway officer. We, however, venture the suggestion that many railroads may find it profitable to study their operating expenses with the view to ascertaining whether instances of overexpenditure for maintenance of way exist on their lines. Transportation costs receive closer scrutiny than maintenance of way costs because they are more tangible. A heavy locomotive hauling a long train will produce more ton-miles per dollar than a small engine hauling a short train, and the returns are available at the end of each month. But the increased costs of maintaining the track in fit condition to carry the heavier locomotive are not so readily available and are spread over the entire year. This problem attains particular importance on branch lines which have a heavy seasonal traffic of short duration with only the lightest train movements during the remainder of the year. For instance, some of the lines in wheat growing regions are maintained to standards that will permit of the use of heavy power so that the annual crop may be handled expeditiously and at low cost insofar as the transportation charges are concerned. However, this implies that the track is in better condition than necessary for the traffic handled during the greater portion of the year. While it is entirely possible that this policy is economically sound, it is to be questioned whether a sufficiently detailed analysis has ever been made in most of these cases to determine the correctness of this assumption with reasonable accuracy.

What Is the Correct Standard of Maintenance?

One of the principal economies claimed for the proposed superpower electrification system is in the consumption of locomotive fuel. The investigators estimate that electric operation in this region would have saved 57.6 per cent per unit of work done, or 8,890,000 tons of coal based on the traffic of 1919. The cost of electrical energy is given as $44,233,000 and the cost of coal as $68,770,000, a saving of $24,537,000. The economies due to the saving of fuel amount to about 38 per cent of the total estimated saving. Since this is such an important item, it will be given the closest scrutiny by all who are interested in electrification. It must be admitted that anyone familiar with the performance of modern steam locomotives will find the basis on which the fuel consumption has been computed very unsatisfactory. The coal used by the electric system has been assumed to be equivalent to two pounds per kilowatt hour at the sub-station. The efficiency of the sub-station is assumed to be 85 per cent, of the distribution system 90 per cent, and of the electric locomotive 82.5 per cent. The output of the electric locomotive is therefore 63 per cent of the sub-station input, making the equivalent coal rate 3.18 pounds per kilowatt hour. The coal consumption of the steam locomotive is assumed to be 7.5 pounds per kilowatt hour, which makes the saving for the electric locomotive on this basis 57.6 per cent. This figure for locomotive coal consumption is altogether too high even for saturated steam locomotives, being almost identical with the value obtained under unfavorable conditions with saturated locomotives on the Chicago, Milwaukee & St. Paul. If the method used in computing the equivalent coal consumption under electric operation is applied to the steam locomotive, the result is quite different. An efficient modern locomotive uses about 2.5 pounds of coal per horsepower hour output while working. Standby losses, firing up, etc., increase this to 3.1 pounds per horsepower hour, or 4.14 pounds per kilowatt hour. On this basis the saving by electrification would be only 23 per cent. It is evident, therefore, that the section of the report dealing with the saving of fuel is open to serious question. In fact the failure to obtain accurate and up-to-date information regarding the steam locomotive wholly invalidates the conclusions regarding the possible saving of fuel.

Extravagant Claims for Electrification

There is no doubt of the existence of a large stock of used machine tools and, in considering machine tool requirements for 1922, the railroads are facing the question as to what extent, if any, they should take advantage of these second-hand machines. Some officers take the stand that a second-hand machine ought never to be installed in a railroad shop and, while this is a somewhat extreme view, there are many arguments to justify it in part. It is a well-known saying that "The first use of any article is the best use." The purchaser of a used automobile, for example, takes a big risk that the trouble and cost of keeping his machine in repair will more than offset the saving in price unless, in buying, he has benefited by the advice of an automobile expert. This does not prove that there are not good bargains in used automobiles and the same is true of used machinery. Slightly worn machines have been bought at a considerable reduction in cost and have given satisfactory service over a period of years, but the point is that used or second-hand machinery should be bought only after the most careful inspection and trial to demonstrate its accuracy and ability to produce. In a particular instance, a reputable machinery dealer learned that a certain railroad was in need of a large boring mill and approached the purchasing agent with the proposition that he had a slightly used machine which would be practically as good as new and could be sold at a considerable reduction in cost. In examining the machine carefully from the under side, an inspector from the railroad discovered that the bed was badly cracked and had been clamped together by bolts and stay irons. The machinery dealer, with the most profound expressions of regret, insisted that the break was unknown to him and stated that the machine had been giving satisfactory service. Admitting that the dealer did not know of this defect, the fact remains that except for the acuteness of its inspector the railroad would have been fooled into buying a defective machine. It is practically impossible to make a thorough examination of any large machine without taking it all apart and even if there are no apparent defects or undue wear, the only way to make sure of its accuracy and productive capacity is to subject the machine to a thorough series of tests under actual shop con-

Second-Hand Machine Tools

ditions. It would probably be unwise to make any hard and fast rule against the purchase of second-hand machine tools, but where such purchases are made the railroads should exercise the greatest care in inspecting and trying out machines before orders are placed. In by far the great majority of cases, the practice which will be most satisfactory in the long run is to purchase and install new machines, made by reliable manufacturers.

Freight House Operation

An article on page 471 of the October 22 issue of the *Railway Age* describes the method of operating the Cedar Hill, New Haven, Conn., freight transfer station of the New Haven. At this station 0.943 tons of freight per hour per man is being handled at an average cost per ton of less than 67 cents. Another article on page 991 of the November 19 issue tells how congestion in the outbound freight houses of the same railroad at Boston has been overcome and the cost of handling freight per ton decreased from 67 cents to 50 cents. The operating conditions at Cedar Hill are radically different from those at Boston. At Cedar Hill the hauls are long while at Boston they are decidedly short. Cedar Hill is a modern plant in all respects while the Boston station has remained unchanged, in physical characteristics, for years. In the face of these varying conditions the railroad is employing tractors and trailers in the operation of both stations with gratifying results. While the stations under discussion exemplify extremes of operating conditions it does not necessarily follow that tractors and trailers can be used successfully in the handling of freight at all points where operating costs are distressingly high. On the other hand the success that has followed these installations certainly may be said to be indicative of the wide range of conditions under which such devices may be put to work with legitimate expectations of satisfactory results, provided the plan of operation has been carefully worked out. Each freight house or freight transfer station presents a distinctive handling problem and no single handling system can be applied to all with success. The fact remains, however, that the opportunities for savings in freight handling, through the adoption of modern methods and appliances are of too great importance to be passed over lightly.

Remarkable Reduction in Railway Accidents

THE RAILWAY MANAGERS have a right to be proud of the accident record made by the railways in 1920. The total number of persons killed, including employees killed in industrial accidents, was 6,958. This is the smallest number killed in 22 years, or since 1898, when it was 6,859. But the number of fatalities occurring has no significance unless related to the number of employees, the number of train miles run, the amount of service rendered, and other factors which necessarily tend to affect the number of accidents occurring. In relation to the number of employees, to the number of miles trains run, and to the amount of traffic handled, the accident record made in 1920, statistics for which year recently were made public by the Interstate Commerce Commission, is the best that ever has been made since statistics upon the subject have been kept.

The accident reports of the Interstate Commerce Commission relate to accidents on all the railways of the United States. The only statistics we as yet have regarding the total number of employees, the train mileage run and the traffic handled in 1920 are those for the Class 1 roads. Therefore it is necessary, in making comparisons, to use the accident statistics for all the railways and the statistics of the Class 1 roads regarding number of employees, train miles run and traffic handled. It is impossible to make a ten-year comparison satisfactorily because in 1910 statistics regarding the number of trespassers killed were not reported. But by using the accident statistics of all railways in 1911 and 1920, and the statistics of the Class 1 roads regarding number of employees, train miles run and traffic handled in these years, we can make comparisons for a nine-year period, which, while not strictly accurate, show the increase in safety of operation as clearly and almost as accurately as would be done by more complete statistics. These comparative figures are given in the accompanying table.

	Year ended June 30, 1911	Year ended Dec. 31, 1920
Total persons killed in train and train service accidents	10,396	6,958
Non-trespassers—		
Passengers	299	229
Employees on duty	2,871	2,107
Employees not on duty	292	91
Persons carried under contract	57	35
Other non-trespassers	1,154	1,867
Non-train accidents—		
Industrial accidents—employees and others	439	463
Trespassers	5,284	2,166

	1911	1920
Number of employees	1,599,854	2,031,927
Passengers carried one mile	32,371,444,793	46,724,880,000
Ton-miles	249,843,166,302	409,970,656,000
Passenger train miles	548,279,061	571,653,863
Freight train miles	608,678,284	633,972,312
Total train miles	1,185,632,129	1,205,626,175

It will be noted that in spite of the large increases in number of employees, in train miles run, and in amount of freight and passenger traffic handled, there was a decline in the number of fatalities to every class of persons, except those classified as "other non-trespassers." The increase in fatalities to "other non-trespassers" was chiefly due to a large increase in the number of persons killed at highway crossings, and this entire increase in the number of persons killed at highway crossings was due to an increase in the number of automobiles struck by trains or trains struck by automobiles.

In 1911 the number of employees for every employee killed was 444, while in 1920 it was 788. This increase of almost 78 per cent in the number of persons employed for each employee killed shows that there was a great decline in the hazards of the occupation of the average railway employee.

In 1911 the number of passengers carried one mile for each passenger killed was 108,265,701, while in 1920 it was 204,038,777. Stating the matter in another way, the average passenger, on the basis of the results of operation in 1911, could have traveled at the rate of 60 miles an hour for 206 years before being killed, while on the basis of the results of operation in 1920 the average passenger could have traveled at the rate of 60 miles an hour for 388 years without being killed. The danger of traveling by passenger train was reduced 47 per cent.

The measures of the public service rendered by railways are the number of passengers carried one mile and the number of tons of freight carried one mile. The number of passengers carried one mile in 1920 was 44 1/3 per cent more, and the number of tons carried one mile 64 per cent more than in 1911. On the other hand, the total number of persons killed in railway accidents of all kinds decreased 33 per cent between 1911 and 1920.

The total number of persons killed on the railways of this country was at its maximum in the years from 1911 to 1914, the highest figure ever reached being in 1913, when it was 10,964. While measures of various kinds to reduce accidents have been adopted on every railway for years, the "safety first" movement really was inaugurated in 1910. The "safety first" movement was different from measures which previously had been adopted, mainly because it was based on fuller and clearer recognition of the fact that most

accidents were due to carelessness and recklessness on the part of the personnel of the railways rather than to defects of their plant. The great reduction of accidents undoubtedly has been due principally to the educational work which has been carried on among employees by officers especially assigned to this duty, and to efforts of "safety first" committees composed of both officers and employees. Those who initiated and carried on this work deserve the greatest possible credit. The accident record of the railways can and should be further improved, and to that end the "safety first" movement should be given even more generous and energetic support by the managements than in the past. In the interest of humanity and in the selfish interest of the railways themselves nothing in connection with railway operation is more important than further increases in its safety.

Proposed Changes in the Transportation Act

THE TRANSPORTATION ACT is the only really constructive legislation for the regulation of railroads ever passed in this country. This is true because it is the only example of such legislation which is in some measure designed to promote increases in railroad service as well as to prevent railroad abuses.

As yet, however, the Transportation Act has been of no benefit to the railroads. Every benefit conferred by it has gone to railway employees and the public. Under it the employees were given a large advance in wages and permitted to keep in effect for many months rules and working conditions which gave them large amounts of pay for work not done. Under it the public has escaped from the series of deficits incurred under government control, with the result, that including both what it has paid in rates and what it has paid in taxes, the total amount it has paid for railroad transportation has been hundreds of millions of dollars less than it would have been if government control had been continued.

The reason why the railways have derived no benefits from the Transportation Act is that certain of its provisions have not been carried out. The Act requires the Interstate Commerce Commission to so fix the rates that for two years ending March 1, 1922, the railways shall earn an average of not less than 5½ per cent or more than 6 per cent upon their combined valuation. On the rates fixed by the Commission the railways have thus far earned an average of less than 3 per cent. The first year the rates were in effect they earned about $400,000,000 less net operating income than they were guaranteed annually under government control. On no possible construction of the Constitution of the United States could the Commission have restricted the railways to lower rates than those actually made by it if the rate-making provisions of the Transportation Act never had been passed.

Any benefit conferred by the Transportation Act upon the railways would have to be obtained by them in future. Curiously enough, however, while the public, under the provisions of this act, or in spite of them, has been saved hundreds of millions of dollars and the railways have lost hundreds of millions, Senator Capper of Kansas, Senator LaFollette of Wisconsin and others are urging the repeal of the rate-making provisions. This is what would naturally have been expected from Senator LaFollette. On the other hand, Senator Capper is a man who has grown very rich in the publishing business. One would naturally expect a man who has shown as much business ability in his own business as Senator Capper has to apply business sense to his work on behalf of the public.

Just what effect would be produced by repealing the rate-making provisions of the Transportation Act? The provision requiring the Interstate Commerce Commission to so regulate rates as to enable the railways to earn at least 5½ per cent has thus far been applied so that they have earned less than 3 per cent, and, furthermore, it automatically goes out of existence on March 1, 1922. The main provisions which would be left after that, if they were not repealed, are the following:

First, that the Commission shall fix such rates that the rates "will under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures and equipment, earn an aggregate annual net railway operating income equal as nearly as may be to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation."

Second, that the Commission shall from time to time determine what will be a fair return for the railways to earn, and "in making such determination it shall give due consideration, among other things, to the transportation needs of the country and the necessity of enlarging such (transportation) facilities in order to provide the people of the United States with adequate transportation."

Third, that any railway which earns more than 6 per cent in a year shall pay one-half of the excess to the government.

There are really but two things required in these provisions which are not required by the Constitution of the United States as repeatedly interpreted by the Supreme Court. All regulating bodies in fixing rates act under the constitutional requirement of so making them as to enable the railways to earn a fair return on the fair value of their properties. One thing this legislation requires which the Constitution does not require is that the Commission in fixing rates shall give due consideration to the transportation needs of the country and the necessity of enlarging transportation facilities in order to provide the people of the United States with adequate transportation. For Congress to repeal this provision would be tantamount to the adoption by it of an order to the Interstate Commerce Commission that in fixing rates in future *it should not consider the need of the country for adequate means of transportation.* Do Senator Capper and those who agree with him want the Commission to fix rates without any regard to the effect that the rates fixed may have upon the adequacy of the transportation furnished to the people of the United States?

The only other effect the repeal of the rate-making provisions would have would be to relieve railways which earn in any year an average of over 6 per cent on their valuation of the necessity of paying to the government one-half of what they earned over 6 per cent. The *Railway Age* would like to see that provision repealed. It would like to see every railway permitted to keep all it can earn. But why should Senator Capper and Senator LaFollette be so concerned lest some railway which earns over 6 per cent shall pay one-half of the surplus back to the government?

The answer is simple enough. This recapture provision is an integral part of the rate-making provisions of the law, and they want all the rate-making provisions stricken out so that the policy of regulation followed before government control, of making all rates as low as they can be made without being held confiscatory, shall be restored.

This "near-confiscation" policy of rate regulation which was followed prior to government control almost stopped the development of railway transportation. A revival of that policy will stop the development of railroad transportation. No industry can live and grow under such a policy. Cessation of the development of the railways under private ownership inevitably will result in government ownership.

The *Railway Age* never talks politics. It deals entirely with railroad affairs. There are times, however, when it is

necessary to refer to politics in order intelligently to discuss some railroad problem. There was a suspicion that certain leaders of the democratic party desired to fasten government ownership of railroads on the country. They brought about the adoption of government control of railroads. Public sentiment reacted against that policy powerfully, and the railways were returned to private operation under the Transportation Act. These democratic leaders in their zeal for promoting government ownership made its adoption impracticable for a time at least.

The republican party in its campaign hand-book in 1920 bitterly denounced the policy of government control carried out under democratic auspices. It opposed government ownership in its platform. Almost every public man, however, who is now advocating the repeal of the rate-making provisions of the Transportation Act is a republican. The revival of the old policy of near-confiscation would be as effective in promoting the cause of government ownership as the adoption of government control was in creating sentiment against it.

Is the country to be treated to the spectacle of leading democrats hindering government ownership by actively trying to promote it, and of leading republicans who pretend to be against it promoting policies directly adapted to bring it about?

Reductions of Rates on Agricultural Products

THE INTERSTATE COMMERCE COMMISSION in a recent decision directed the western railways to make general reductions in the rates on hay, grain and grain products which would have averaged around 15 per cent and which would have cost about $35,000,000 a year. The railways, after consultation with the Interstate Commerce Commission, have instead announced reductions on all agricultural products throughout the country averaging about 10 per cent and which will cost about $55,000,000 annually.

The reasons why the railways have taken this step are easily discernible. The reductions in rates on hay, grain and grain products suggested by the commission would have been borne mainly by only part of the railways. The reductions the railways have decided to make on all farm products will not cost some of the railways so much and will be borne by all the railways. Furthermore, the reductions suggested by the commission would have conferred relatively large benefits on only a part of the farmers. The reductions actually to be made by the railways, while they will benefit grain producers relatively less, will benefit the farmers of the country as a whole to a larger extent. The farmers as a class have suffered the greatest reductions in the prices of their products within the last year and a half. Therefore, they have been the least able to pay the freight rates which were put into effect on August 26, 1920.

The wisdom of the action taken by the railways will be determined by future developments. If there was good reason for general reductions of the rates on any class of commodities this reason applied with special force to those on farm products. First, the farmers needed them more than any other class of producers; second, the Interstate Commerce Commission had decided that the rates on one large class of farm products ought to be reduced. It is very doubtful if the decision was warranted either by the facts or law, but the decision had been rendered and the railways could not disregard it or attack it in the courts without antagonizing the largest body of shippers and the most powerful regulating body in the country.

Already complaints are heard from some other classes of shippers, however, because the railways voluntarily have given this reduction of rates to the farmers without giving corresponding reductions to other shippers. Most of these complaints are of very questionable validity. It is true that the prices of some other commodities have declined as much as those of farm products. Among the commodities which are selling for less than in 1913 are copper, tin, zinc, coffee and rubber. Other things which are selling at or very near their pre-war prices are steel billets, steel beams, wool, crude petroleum and sugar. Outside of farm products, however, the average wholesale price of all commodities is almost as much higher than in 1913 as is the average freight rate, and certainly there is no economic justification for the numerous producers whose average prices still are relatively as high when they are compared with the prices of 1913 as are the freight rates charged on their commodities, to demand reductions of rates.

The most important question raised by this reduction of rates is not whether it is fair to reduce the rates of some classes of shippers and not those of other classes, but whether, from the standpoint of the public welfare, it is expedient to reduce any rates under present conditions except those which can be shown to be hindering the movement of traffic. Any reduction of rates made for any purpose except that of moving traffic which otherwise would not move reduces the net operating income of the railways. Whatever reduces their net operating income will reduce their ability to buy equipment and materials and employ labor for the purpose of rehabilitating and enlarging their facilities. Whatever has this effect will tend to protract the industrial depression and to impair the ability of the railways to handle the country's commerce when general business revives. The very classes that will benefit most immediately by reductions in rates may in the long run lose the most if the railways are so crippled that next year or the year after they cannot handle all the traffic offered to them.

This reduction in the rates on farm products is made in the expectation of reductions in wages and other operating costs and will remain in effect only six months if these expected reductions in operating expenses are not secured. If they help the railways to obtain needed reductions in operating expenses they will serve a useful purpose both immediately and in the more distant future. If they do not have this effect they will do more harm than good.

New Books

Questions and Answers on the UC Equipment, 1921. *72 pages, 5 in. by 7 in. Published by the Air Brake Association,* 165 *Broadway, New York. Price* 50 *cents.*

The Air Brake Association has just added to its list of educational books, one on the Westinghouse UC equipment. The book is intended for those men engaged in railroad service who desire to inform themselves on the construction, operation and function of the new UC passenger air brake equipment. It is a radical departure from much air brake literature in that it does not necessitate an intimate acquaintanceship with ports and passages. Omission of a detailed consideration of the many intricate ports and passages of the universal valve should assist in readier comprehension of its general principles, of which the average reader should be informed. Based upon the foregoing, the subject has been covered not only by a text, but also by "Questions and Answers." For those readers who desire general information in a minimum of time, the first 50 questions and answers have been prepared. For those who prefer the regular descriptive form, a "Summary" has been included. Those readers who seek a more exhaustive treatment of the subject may find it in either the complete "Questions and Answers" or the complete text of the book.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated.*]

Sometimes It Is a Disgrace to Be Poor

NORTH PLEASANTON, Texas.

TO THE EDITOR:

I note a letter in your October 8 issue which appears under the head of "No Disgrace to Be Poor." I would take issue with "Subscriber." The difference between wealth and poverty is not measured by the gross incomes or amounts available to spend. Two families equal in size and with the same income live side by side. One family, due to its shiftless habits and poor management, is continually in debt, lives in poor quarters, wears poor clothes, and as a consequence is constantly dissatisfied and discontented.

The other family manages well, watches the small wastes and as a result lives well, owns its own home, dresses well and is generally pleased with life. In such a case it is a disgrace to be poor, and a large number of railroad mechanical departments are similar to the shiftless family. Before such organizations put up the plea of poverty, would it not be wise to make an inspection and ascertain if, without any changes in our plant, we could not prevent wastes in time of men and material which would, if conserved, soon equip our shops with the machines whose absence we now bemoan.

E. R. BREAKER.

The "Big Stick" versus the Golden Rule

KANSAS.

TO THE EDITOR:

I have been an interested reader of your journal for a good many years and have been "hankering" for some time to say something through its columns. There has been much said about efficiency, co-operation and "get-together" movements, as between officers and employees, but little has been suggested as to how this co-operation could be brought about.

To my mind the greatest factor in the successful operation of railroads, or any other business for that matter, is the human element, and in railroading, at least, it has been given but little of the right kind of consideration. Officers are chosen mainly because of their knowledge of railroading and not because of their character; a big majority of them are men who, although they measure up to the average man of the world, are not men who through their character and habits inspire in the employees loyalty and efficiency towards the railroads or respect for the officers themselves. This may seem a hard thing to say, but it has been my observation from an experience of 30 years as a train dispatcher, a position just between that of officer and employee.

I have seen railroad unions grow from nothing to their present strength, largely, I believe, because officialdom has tried to handle men on the "big stick" principle instead of the "golden rule" plan—and it did not take a man of any great mental capacity to see where it was all leading. The catastrophe which has just been averted, for a time, is a sample.

To have a new era in railroading we shall have to get out of our hearts selfishness, greed and the domineering attitude, and establish the "brotherhood of man" idea, and to do this some one in authority will have to commence by doing "good for evil." Who will it be? TRAIN DISPATCHER.

The Rock Island Employees' Clubs

HAILEYVILLE, Okla.

TO THE EDITOR:

The officers and the employees of the Rock Island Lines were glad to note that the *Railway Age* in its issue of November 5 took cognizance of the fact that their road was one of the three of the country's carriers which handled more net ton-miles of freight in August, 1921, than in August of last year. The editor remarked that he had been informed that the Rock Island had been favored with a considerably improved morale in recent months.

The morale of this system is being improved in various ways. One of the recent adventures in this direction was started last May under the direction of Hal. S. Ray, assistant to President Gorman, and who is known on the Rock Island as Hal "Service" Ray. Mr. Ray devotes his time to matters of personnel and public relations, and his work is directed toward bringing about a better spirit of friendship and co-operation among employees, increased efficiency and courtesy toward the public.

Rock Island employees' clubs have been formed at various terminals along the railroad and "get-together" meetings are staged each month which bring the employees, their families and the public together. As an illustration as to what these clubs do, the first meeting of the Haileyville club was held at Rock Island Lake near Haileyville on August 4 and consisted of an all-day picnic, and dancing and other pastimes in the evening. The second entertainment was an original play given by home talent at the local theatre. The third was an oldtime spelling match, card party and dance. The fourth was a general entertainment consisting of various indoor games to which everyone was invited. The next to be staged will be a negro minstrel show.

The active workers in the club, as well as others, have been encouraged by the presence of several of the officers of the system at each entertainment. All entertainments and meetings have so far been well attended by the railroad people and the public. Rock Island clubs at other points along the line are also, we understand, doing well. The results of such efforts will make themselves felt in more ways than one to the credit of the Rock Island Lines.

J. L. Coss,
Train Dispatcher, C. R. I. & P.

Ford a Disappointment

BUFFALO, N. Y.

TO THE EDITOR:

In an interview (*Railway Age*, November 12, page 939) which Henry Ford gave at Washington recently, he made some recommendations for improving railroad operation which were about as pertinent and would be just about as valuable for the purpose intended as his famous "Peace Ship" was in "getting the boys out of the trenches by Christmas."

To his suggestion that "the unproductive parasite stockholders" be eliminated, one cannot refrain from countering that no large railroad approaches the position of the Ford Motor Company as a close corporation. It takes the peculiar mental twist of a Ford to advance the opinion that the investors in railroad securities, most of them holders of small amounts, should be denied a return on their holdings, while the manufacturer of the Ford car is allowed to grow rich beyond the dreams of avarice.

On the other hand, Mr. Ford's suggestion to expedite the movement of freight is a sound one. The average operating officer's insistence on the maximum possible train load is all too frequently like the straw which broke the camel's back. Many, many times an engine will stall and tie up traffic which if one or two cars less had been placed in the train,

would have made the division in good time with consequent saving in fuel and wages.

Mr. Ford's ideas on railroad finance are truly remarkable; he seems to forget entirely that when talking of railroads he is not considering a gold mine like the business of making flivvers. He implies that the stock of the railroads should be owned by the employees, a very desirable condition, it is true. The writer is an employee of a very excellent railroad, the Erie, but he can hardly be censured for not caring to invest a large amount of money in its stock. Ford adds that a hue and cry would be raised if it were attempted to get the ownership of the railways into the hands of the employees because people had invested in them for the financial protection of their families, their children; he adds sarcastically, "Protection from what? From the necessity of earning their living?" I will wager that it is not Mr. Ford's intention that his son Edsel shall ever have to face the necessity of earning his living, and yet according to the old adage that charity begins at home, it would seem more fitting for him first to turn over the Ford plants to his employees before suggesting that the owners of the railroads be compelled to do so.

These are strange sentiments from our great apostle of thrift and industrial paternalism. Are we to imply that Henry has come out for the Plumb Plan? I quote Mr. Ford as follows: "If the brakeman on a railroad owns stock in it he has an added inducement to competent service. If the railroad is a success it is due to him (the brakeman) and his fellow workmen and they are entitled to the profit." Not a word is said about the executive whose guiding hand enables a great railroad system to function smoothly, or the trained engineers and designers who have planned the elimination of grades and have made such remarkable progress in effecting improvements in locomotive design in recent years, or of the division officers and senior clerks whose efforts to produce transportation at a minimum of expense are unceasing. As usual, Ford plays to the galleries, and the brakeman, who contributes less to the railroad organization than perhaps any other employee, and whose actions cannot affect operating results in the least, unless he fails properly to perform the comparatively slight service required of him, gets all the credit; the usual Ford propaganda, like the famous $5 a day sweep-up men in his Detroit factory.

And in the one department of the science of railroading where we would expect the most from Ford, he fails us utterly. When he bought the D., T. & I. some of us had a suspicion that he would try to operate it with "flivvers." But now he makes the childish and inaccurate statement that a freight train weighs several times as much as the load it carries (a standard P.R.R. four-hopper coal car will hold 77 tons and weighs but 23 tons). It is a well-known fact that nothing contributes so much to the expense of operating a railroad as light equipment of insufficient strength. Ford refers to the fact that a bicycle weighing 20 lb. will carry a man weighing 200 lb., but a bicycle does not have to pull 100 other bicycles each with a man on it, or be subject to impact of hundreds of tons weight. It is true that lighter cars can be constructed but only at the expense of riding qualities and safety; one would hardly care to take a transcontinental journey at a speed of 60 miles an hour in one of the horse cars which navigated West street, New York, a few years ago. I used to be worried as to whether the originator of the "flivver" had to ride in one of his own instruments of torture on all occasions, but my mind was relieved by a recent press notice stating that Henry Ford had purchased one of the finest make European cars for his own use for $15,000. Patriotic? So after all he does not practice what he preaches to the railroads.

After Ford has been running his railroad a little longer and knows more about the countless folks whose principal object in life seems to be to beat the railroads, he will have no fault to find about the comparatively small legal forces which every railroad finds necessary to employ as a matter of self-preservation.

What Mr. Ford says about railroad bookkeeping and accounting being "complicated far beyond all necessity," is alas, only too true; but it is pertinent to remark in this connection that his railroad was called to account in no unmistakable terms last month by M. O. Lorenz, director of the bureau of statistics of the Interstate Commerce Commission, in connection with its request to be relieved from making various reports required by the commission from Class I railroads.

It is quite evident that Mr. Ford is not the Moses to lead the railroads out of the wilderness, and into the promised land, that some of his admirers think him to be.

C. C. HENKEL.

University of California Overlooked

BERKELEY, Calif.

TO THE EDITOR:

An "Ohio State University Student" says in your issue of November 5, apropos of university instruction in transportation: "The truth is that those universities which have a College of Commerce offer work in transportation as a matter of course. Such universities are Chicago, Yale, Leland Stanford, Illinois, Wisconsin, Harvard and a host of others."

I dislike to inject an irrelevant remark into a perfectly good discussion, but, if a university upon the Pacific Coast is to be selected for illustration, why pick Leland Stanford, which in spite of the writer of the letter referred to, has no College of Commerce, and omit the University of California, which has a large and flourishing one with courses in transportation well represented in its curriculum. Would you not suppose that a student of Ohio State University would be better informed after the football game at Pasadena last year?

STUART DAGGETT,
Dean, College of Commerce, University of California.

Make Better Use of Freight Cars

WASHINGTON, D. C.

TO THE EDITOR:

The diagram on page 948 of the November 12, 1921, *Railway Age* indicated that the surplus freight cars decreased from 500,000 to 125,000 in the six-month period ending October 15, 1921. Bad order cars increased from about 280,000 to 350,000 in the same period. That the railroads have such a large number of bad order cars indicates inefficient operation, which is costly both to the railroads and the public which they serve.

Freight cars are built to transport certain materials and have a given capacity. Efficient operation depends upon their being loaded to or near capacity and moved as rapidly as can be done economically. When a loaded car in a train is side-tracked or held in a yard or is moved at a rate that averages 30 car miles per day, it is not being used efficiently.

My suggestion is to so rate the locomotives that they can readily handle their trains without strain or delay and thereby reduce the number of cars that are damaged in service.

I. C. C. Accident Bulletin No. 78 shows the cost of accidents in 1920 to have been 38 per cent greater than in the previous year. Much of this annual waste should be eliminated by efficient operating methods. Therefore, load the cars to capacity but reduce the number of cars in the train so that the locomotive is never overloaded. The net result would be decreased operating cost all along the line.

AN ENGINEER READER.

Superpower Development Would Effect Much Needed Economies

New Haven, Conn.

To the Editor:

The Superpower Survey report sets forth facts from which certain conclusions can be demonstrated. One of these is that there is a great deal of capital, coal and labor going to waste in the development of electrical and steam energy at too high a cost in the Boston-Washington zone. There should be greater economy in the development, transmission and consumption of this energy. The increase of distance over which electricity may be practically transmitted, the fact that it is not substantially affected by the law of gravitation and that it is instantaneous in transmission, all indicate the economy of a tying together of the sources of energy in the Boston-Washington zone.

The superpower plan would result in a kilowatt hour created at less cost, in more kilowatt hours being produced with a less amount of capital and a better controlled consumption and consequently a better load factor for the producers of power. Here in New England he will be a public benefactor who can make one ton of coal do what now takes two tons and this is what the Superpower Survey apparently demonstrates.

E. G. Buckland,
Vice-president, New York, New Haven & Hartford.

Railway Storage Battery Cars

New York.

To the Editor:

In an article in the *Railway Age* of October 1, 1921, entitled "The Field for Gasoline Railway Motor Cars," by L. C. Josephs, Jr., the assertion is made that storage battery cars failed on railroads because of their limited radius of operation and inefficient transmission of power. The Edison storage battery car is not a failure in any sense and this statement is at variance with the experience of users of our car.

In justice to Mr. Josephs, we quote the following from his answer to a letter from us: "My ideas on this subject coincide with those set forth in the paper by Messrs. Dodd and Arnold, read before the International Railway Fuel Association, May, 1913, in Chicago." From this it would appear that his conclusions as to the storage battery car were based on a report made in 1913. Mr. Josephs apparently has not been in touch with the development of our industry since that date. While we do not concede that the storage battery car was a failure at that time, it would be just as useless to consider here the performance of the self-propelled battery car prior to that time as it would be to declare that the gasoline self-propelled car was a failure because prior to 1913 it had been tried on a number of railroads and discarded as an absolute failure and a dangerous fire risk as well.

In passing, let it be said that the Railway Storage Battery Car Company did not enter this industry until subsequent to 1913; that previous to that time builders of storage battery cars had entertained and followed the theory that a storage battery car must be of excessively light weight construction and that such oddities as loose wheels, stationary axles, and specially constructed light weight trucks and other unique members in the car body construction were considered essential. The Railway Storage Battery Car Company, however, in entering the field discarded both this theory and practice and adopted M. C. B. standard construction and has since developed and sold cars meeting this high standard in every particular.

There can be no question that the electric storage battery car is the simplest, cleanest and easiest operating railway unit that has ever been invented, but in view of the fact that this article is written to controvert certain assertions and to disprove them by instances of actual operation, no enlargement will be made here on its numerous advantages, such as the few parts; the absence of any engine and the incidental and expensive wear on engine parts; the absolute elimination of any fire risk.

To meet the assertion that the storage battery car is a failure in general, due to its limitation of radius of operation and inefficient transmission of power, we cite the following actual records of cars that have been placed in operation since 1914, carefully tested as to the very two points alleged by Mr. Josephs:

Pennsylvania Railroad:

Philadelphia to Baltimore—92.4 miles, 1.1 k.w.h. current consumed p.c.m.
Mechanicsville to Chambersburg, Waynesboro to Richmond and return } 145 miles, 1.9 k.w.h. current consumed p.c.m.

Canadian National Railways:

Between Trenton and Belleville—228 miles daily, 1.2 k.w.h. current consumed p.c.m.

Campbellton to Bathurst and return—126 miles daily, 1.2 k.w.h. current consumed p.c.m.

For details of continued successful economical operation proving the success of the storage battery car in general, reference is made to the following Edison storage battery cars in operation throughout the world: Long Island Railroad; Pennsylvania System; Chattahoochee Valley Railroad; Cambria & Indiana Railroad; Chicago, Terre Haute & Southeastern Railroad; Towson & Cockeysville Electric Railway; United Railways of Yucatan, Progreso, Mexico; Havana Central Railroad, Havana, Cuba; San Salvador & Santa Tecla Railroad, Salvador; Tranvia de Oriente, Bogota, Colombia; Tranvia de Guayaquil, Guayaquil, Ecuador; Tranvia de Pisco, Pisco, Peru; Tranvia de Merida, Merida, Mexico; Tranvia de Iquique, Iquique, Chile; Tranvia de Huacho, Huacho, Peru.

Particular attention is directed to the fact of the operation of the car on the Canadian National Railways between Trenton and Belleville, Ontario, making a total of 228 miles a day with this one car, which mileage is admitted to be a fair maximum of the average branch line mileage on a steam railroad. It should be further noted in connection with this record, that although this car had been in service elsewhere for four years before being placed in operation by the Canadian National Railways, up to the present it has performed this mileage consistently for 178 consecutive days without being out of service for any cause whatsoever, mechanical or otherwise.

In view of the fact that without a particularly low cost of current, the cost of operation of this car over this mileage is 3 cents per car mile (based on the power consumption of 1½ k.w.h. per mile at 2 cents per kw), there is no inefficiency of power transmission from the practical operating standpoint, and we confidently challenge not only the gasoline self-propelled unit but any other known unit of railway propulsion to show any such power economy in continuous operation, ton for ton.

The foregoing list comprehends cars in operation not only in the temperate but in the torrid zone near the equator; and since 1912 a storage battery car has been operated in Alaska. It must be remembered, however, that all of the foregoing are cars operated with the Edison storage battery, which is an alkali and not a lead acid battery. Too much stress cannot be laid upon this fact.

We seek no controversy with Mr. Josephs, because he probably has an erroneous belief that the development of the storage battery car had been arrested by the outbreak of the war in 1914 and that its use on railroads can only be judged by the certain failures prior to that time, losing sight of the fact that the very purpose of Mr. Edison in projecting an alkali battery was to overcome defects which were par-

ticularly responsible for these failures, and the further fact that the Edison storage battery car industry has been developed just as much, if not more, than the gasoline car, since 1914.

In the United States, this is an error into which motive engineering experts and engineers in general have been too prone to fall without investigation of the great progress we have made as demonstrated by actual tests and operations.

L. KLOPMAN,
General Manager, Railway Storage Battery Car Company.

Long Sleeping-Car Runs

NEW YORK.

TO THE EDITOR:

That through sleeping car line from Aberdeen, Scotland, to Penzance, England, 785 miles, which you notice in your issue of October 29, page 846, is an interesting development (provided there are enough people in Scotland desiring to visit Land's End to make the business profitable); but the funny part of it is that, though there may be a through "line," there is no through sleeper. You must have read your London exchanges with insufficient care. Between Aberdeen and Penzance cars are attached to and detached from the train at a number of places; and, as I read the statements, a day coach is the only vehicle which runs through. The run takes some 22 hours, and passengers cannot find berths, on the southbound trip, until they reach Oxford; while on the northbound trip, leaving Penzance at 11 a. m., the sleepy passenger cannot refresh himself by complete and satisfactory recumbency until he gets to York at 11.15 p. m.

The published accounts would seem to indicate that an American passenger agent (of a former generation) may have had a hand in preparing them; for the fact that there is no through sleeper is obscured as skilfully as possible.

Would any American railroad, in its efforts to please the public, employ any such half-way measure? Probably not. However, it is not for us to criticize. Changing from one car to another (at a convenient place) at bedtime, is not an unmixed evil. Long journeys have elements of tediousness. The people of England are not much used to 700-mile journeys, and very likely they will prefer to educate themselves by degrees.

In this country the longest through-car runs have been those of "tourist" or second-class sleepers. Travelers who use the highest grade of sleeping cars may have reasons for not desiring to go to extremes in this matter. England is not so slow as she is often painted.

L. B. G.

Why Employees Misunderstand Managements

TO THE EDITOR:

The greatest problem facing the railroads today is to create a feeling of understanding between the men and the managements. This can be accomplished by a policy of education coupled with complete frankness on both sides.

Why do the men feel the way they do towards the managements? Sometimes from observation of the lack of co-operation between departments and often even between heads of the same department; by failure of the operating officials to keep in close touch with the men and conditions; by officers following the course of least resistance instead of taking the initiative and changing methods and practices to agree with new conditions. Suggestions are often met with rebuff, or with the standpat reply "We can't vary our practice or we can't do that as it is out of the ordinary, etc."

The men are impressed and discouraged by the complete failure in many cases to remedy the practices and conditions that were in effect 20 years ago, and have in other lines of business been superseded by modern methods; by criticism that is often unjust and technically critical, instead of being constructive; by lack of understanding by the men of the financial conditions of the roads, and mistaken impressions that no one takes the pains to correct; by the attitude of the management of making a good paper showing for one year at the expense of the future; by the management spending its best talents and abilities to evade issues and conditions that have to be met, which with the same expenditure of brains could be solved as easily; by taking away from the men their incentive and initiative in various ways and substituting "red tape" and too much system.

So much for criticism. What will change these conditions? Absolute confidence between the men and management, created by humanizing the latter; by personal relations that are closer; show the men that the management desires to meet them on a frank and open basis; let them know the exact financial status of the road; place before them the problems you face in operating the road. Let them know what the materials and supplies cost that they consume and have charge of. Explain what train and train loading statistics mean in dollars and cents; give them a financial interest in the company through the privilege of buying stock and equipment certificates; create teamwork between departments; make your plans for economies consistent—don't set the example of waste here and save there.

If possible help the men to build and own homes and show an interest in their welfare. Let the men be interested and they will eliminate the shirkers themselves. Show them the reasons for different acts that look trivial on the face but grow to be mountains by discussion without a basis of facts. Help the men to get over the road, to keep the cars moving, to make a success of economical practices and methods, to reduce damage and claims to lading and equipment, and help them to have an interest in keeping the physical property in the highest state of efficiency; make them feel that the management is interested in each man's personal efforts and that discipline will be administered without fear or favor.

Meet the men on this basis as "man to man" and you will find that the men will meet you in the same spirit, which is the only thing that can save the roads from going under with the present conditions.

ONE WHO BELIEVES IN 50-50.

Body of Unknown American Soldier Being Placed on Train for Havre for Passage to America

The Body Was Buried with Appropriate Ceremonies at Arlington National Cemetery on Armistice Day.

Going Up to Clark's Summit With Five Engines

Lackawanna Success the Result of Supervision

Adequate Facilities, Good Morale and Careful Checking of Details Feature the Road's Operation

By Charles W. Foss and James G. Lyne

Part I

THE DELAWARE, LACKAWANNA & WESTERN has been considerably in the public eye in recent months. This has been due to a variety of reasons, among which the most important are: (1) The declaration on July 28 of a 100 per cent stock dividend, following the approval by the Interstate Commerce Commission of this step to capitalize a portion of the company's surplus; (2) the segregation of the road's extensive coal properties and the formation of the Glen Alden Coal Company, which latter company began to function on September 1, and (3) the rather remarkable recovery in recent months in the Lackawanna's net earnings, sufficient so that the property had in September an operating ratio of but 69.4 per cent. Its net railway operating income in September was $1,930,927 and for the first nine months of 1921, $9,825,096, although a smaller amount of traffic was handled than in the first nine months of 1920 and in spite of increased rather than decreased expenses for maintenance.

The road has always been conservatively financed. It is generally accepted that, because of the road's policy in former years of charging to income account its expenditures for additions and betterments, the property account as it appears on the balance sheet is far below the actual value of

TABLE I—REVENUES AND EXPENSES OF OPERATION, 1912 TO FIRST SIX MONTHS OF 1921

Year ended December 31	Coal revenues	Mdse. revenues	Passenger revenues	Total revenues	Total expenses	Op. ratio	Net rev. from operation	Net ry. op. income
1912	$13,280,304	$13,999,359	$7,722,953	$37,564,511	$24,146,423	64.28	$13,418,088	.....
1913	14,418,507	15,089,057	8,549,346	40,784,148	25,573,842	62.71	15,210,306	.....
1914	14,040,574	14,448,308	8,158,458	39,249,790	25,417,882	64.76	13,831,908	.....
1915	13,364,007	18,742,617	8,218,316	44,786,731	27,756,947	61.98	17,029,784	$15,009,589
1916	14,475,244	23,229,865	8,674,863	51,580,999	31,940,974	61.92	19,639,925	16,439,919
1917	17,130,291	24,637,415	9,289,838	57,211,224	37,676,488	65.86	19,534,736	16,430,951[1]
1918	19,009,846	31,287,554	11,204,813	68,740,076	49,925,684	72.63	18,814,392	16,011,656[2]
1919	19,055,523	32,839,878	12,380,787	71,824,047	56,065,251	78.06	15,758,796	11,947,364[3]
1920	20,228,484	40,132,599	13,868,517	83,340,062	73,840,729	88.60	9,499,333	5,186,136[4]
1921—First six months	.....	.....	.....	42,279,985	35,665,988	76.89	6,613,996	4,662,496[5]

[1]Excludes war taxes 1917..... $330,000
[2]Excludes war taxes 1918..... 768,474
[3]Excludes war taxes 1919..... 1,710,374
[4]Includes war taxes 1920..... 918,750
[5]Includes war taxes 1921..... 561,458

TABLE II—CORPORATE INCOME ACCOUNT, 1912 TO 1920

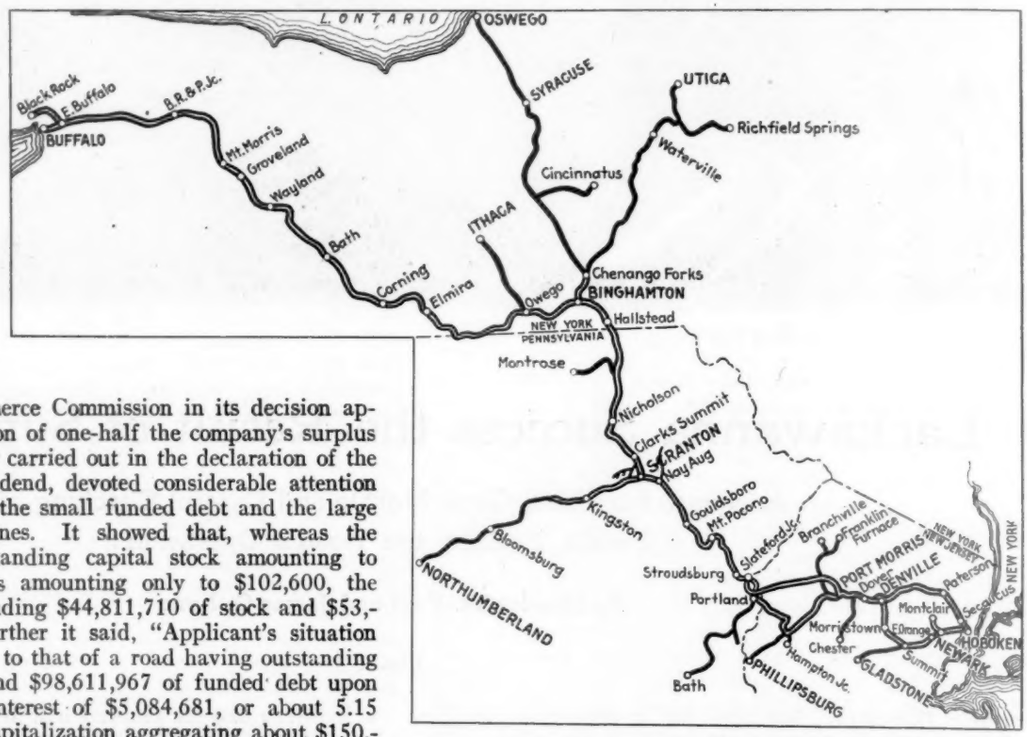
Year	Operating income	Coal dept. earnings	Total additional income	Total income	Rental for leased roads	Total deductions	Net	Dividends	Rate per cent	Balance
1912	$12,207,730	$2,111,897	$5,493,045	$17,700,775	$5,688,588	$7,658,704	$10,042,071	$6,028,806	20	$4,013,271
1913	13,742,106	1,270,020	4,328,094	18,070,201	5,928,930	8,370,585	9,699,616	6,028,800	20	3,670,816
1914	12,121,918	2,355,562	6,829,197	18,951,115	5,874,935	6,981,475	11,969,639	8,444,080	20	3,525,559
1915	14,912,945	1,536,916	5,026,013	19,938,958	6,063,815	8,975,819	10,963,140	8,440,080	20	2,519,060
1916	17,114,593	2,899,309	7,532,565	24,647,158	5,983,152	8,447,010	16,200,148	8,440,080	20	7,756,068
1917	15,940,064	4,321,268	8,800,963	24,741,027	6,272,191	9,370,831	15,370,197	9,499,590	22½	5,870,607
1918	14,174,529	3,626,710	4,565,921	22,367,160	6,133,886	9,533,108	12,834,052	8,444,080	20	4,389,972
1919	17,324,424	4,989,682	3,565,541	25,879,647	6,126,908	9,807,447	16,072,200	8,444,455	20	7,627,745
1920	13,634,114	6,503,942	5,308,464	25,446,520	6,128,996	11,771,411	13,675,109	8,444,110	20	5,230,999

the property. The total interest on funded debt in 1920 was but $6,156. This statement is made with due cognizance of the fact that payments to leased lines total over $6,000,000 annually. Dividends have been paid at the rate of 20 per cent annually since 1905, with the exception of 1917, when 22½ per cent was paid, and of 1909, in which year the Delaware, Lackawanna & Western Coal Company was organized and cash dividends aggregated 75 per cent. A short while ago, as noted above, a stock dividend of 100 per cent was declared and the dividend rate on the increased capitalization has since been made 3 per cent quarterly, or 24 per cent annually on the former capitalization.

The Interstate Commerce Commission in its decision approving the capitalization of one-half the company's surplus of $90,000,000, as later carried out in the declaration of the 100 per cent stock dividend, devoted considerable attention to the relation between the small funded debt and the large payments to leased lines. It showed that, whereas the Lackawanna had outstanding capital stock amounting to $42,220,550 and bonds amounting only to $102,600, the leased lines had outstanding $44,811,710 of stock and $53,697,657 of bonds. Further it said, "Applicant's situation is in a sense equivalent to that of a road having outstanding $42,220,550 of stock and $98,611,967 of funded debt upon which it pays yearly interest of $5,084,681, or about 5.15 per cent, with a total capitalization aggregating about $150,000 per mile of road and $52,100 per mile of track."

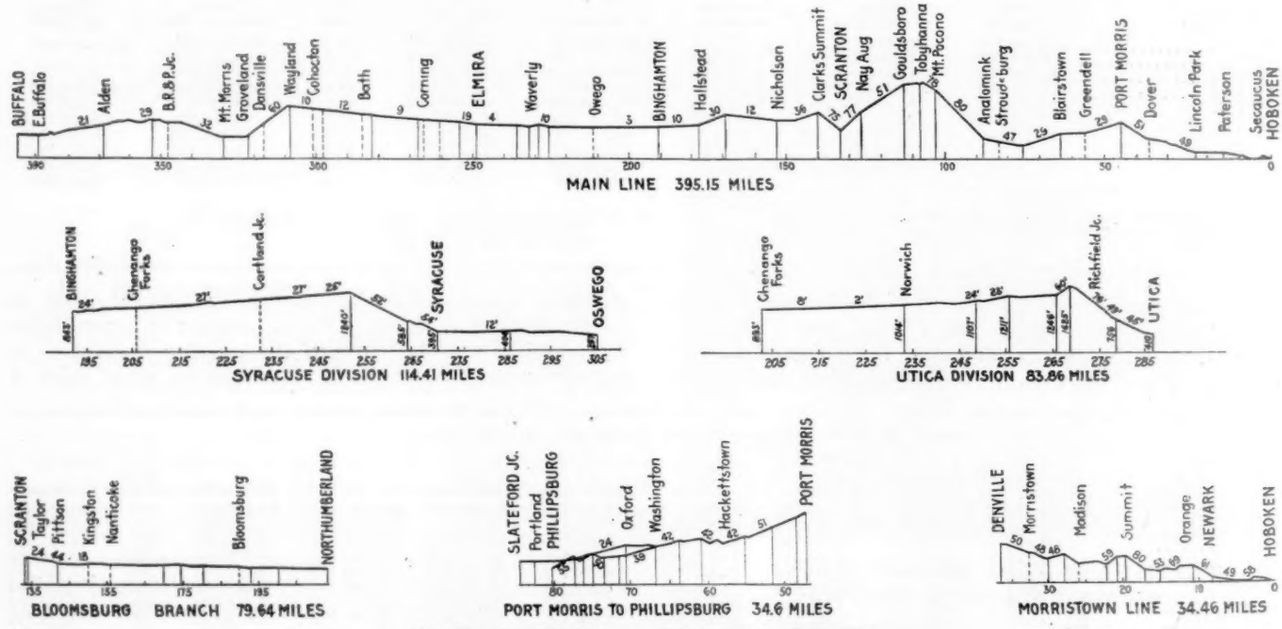
Segregation of Coal Properties

The Lackawanna was built primarily to handle anthracite coal and prior to about 1900 its traffic in other commodities was of comparatively small importance. The railroad owned the coal lands, mined the coal, transported it and sold it. The selling activities, however, were dropped in 1909 upon the organization of the Delaware, Lackawanna & Western Coal Company. Effective September 1, 1921, the railroad divested itself of its coal properties—the mines and the business of working them being turned over to the Glen Alden Coal Company. The Lackawanna mined some 9,000,000 to 11,000,000 tons of coal annually, and derived from its coal department earnings of from $1,500,000 to over $6,000,000 yearly.



The Delaware, Lackawanna & Western

The Glen Alden Coal Company has been capitalized with 846,000 shares of no par value—this being the same number



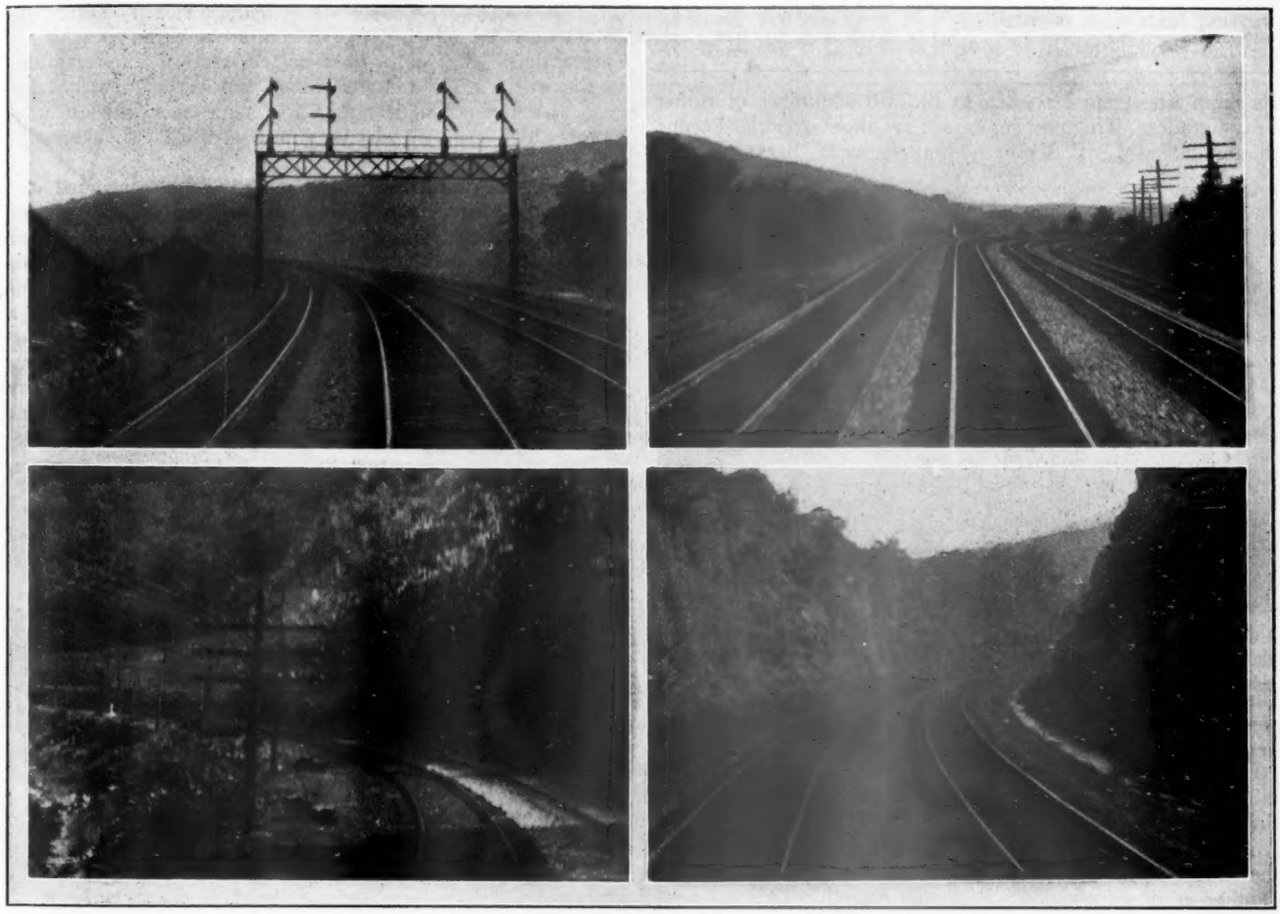
Profile of Main Line and Important Branches

of shares of Lackawanna Railroad stock as were outstanding prior to the declaration of the 100 per cent stock dividend. The Glen Alden shares were offered to the railroad stockholders on record June 15 on the basis of one share of Glen Alden to one share of Lackawanna at a price of $5 per share. The coal company has delivered to the railroad a mortgage of $60,000,000 paying 4 per cent interest. It was further provided that the coal company must establish a sinking fund of $1,500,000 annually, beginning September 1, 1926, to be continued until the $60,000,000 has been paid; if the coal company mines more than 12,000,000 tons of coal in any year, the sinking fund must be increased to $2,000,000. The Delaware, Lackawanna & Western Coal Sales Company has been continued as the sales agent of the Glen Alden Company.

The segregation of the Lackawanna's coal properties into the hands of a separate company will be most unlikely to affect measurably the movement of the coal from these mines over the Lackawanna Railroad. It will presumably have some result on the Lackawanna earnings—what result, however, can only be determined by the developments of the future. It does not appear that it will be adverse. The important point, however, is that the coal properties have been segregated. It must be borne in mind in reading the remainder of this article that the Lackawanna Railroad—since September 1, 1921—no longer owns coal mines nor mines coal. It has now become a transportation company exclusively.

Service Chief Asset in Competition

The Lackawanna has the shortest line between New York and Buffalo—396 miles. The total mileage of the system is 995. Of this total the Lackawanna owns but 277, leases 703 and has trackage rights for 15. Although the system is small, it has been able to compete quite handily with the larger trunk lines having through lines of their own between New York and Chicago. The road's largest single item of traffic is, of course, anthracite coal, which makes up normally about 40 per cent of the total tonnage. The Lackawanna, however, also carries a large tonnage of high class merchandise freight—its chief asset in the competition for which has been its service. The road is noted for its ability



Some Scenes Along the Line Between Hoboken and Scranton

TABLE III—TRAFFIC AND OPERATING STATISTICS

Year	Net tons Anthracite coal	Other freight	Total freight tons	Total ton mileage	Average haul	Rev. per ton mile cents	Rev. tons per rev. train mile	Miles per car per day	Gross tons per loco. mile	Gross tons per train mile	Net tons per train mile	Average tons per loaded car	Per cent of loaded to total car miles
1912	9,501,967	13,394,359	22,896,326	3,921,197,831	171.26	...	602.38	23.7	.....	.....	.....	....	....
1913	10,178,179	14,544,493	24,722,672	4,268,124,897	172.64	...	659.58	25.6	.....	.....	.....	....	....
1914	9,803,093	12,293,423	22,726,516	4,030,594,486	177.35	...	654.94	26.5	.....	.....	.....	....	....
1915	9,455,405	13,715,372	23,170,777	4,391,419,183	189.52	...	687.76	28.5	.....	.....	.....	....	....
1916	10,968,286	17,301,637	28,269,923	5,263,262,974	186.18	.72	769.62	28.8	1,074.55	1,659.35	803.12	26.13	67.63
1917	12,587,055	17,890,436	30,477,491	5,591,042,823	183.45	.75	816.39	30.0	1,094.47	1,673.29	847.71	28.51	66.80
1918	12,203,916	18,168,821	30,372,737	5,574,773,609	183.55	.90	840.20	29.0	1,073.64	1,682.21	866.73	30.25	66.69
1919	10,418,250	15,564,298	25,982,548	4,830,065,815	185.90	1.07	859.71	28.3	1,154.67	1,763.94	895.17	29.12	68.72
1920	10,219,848	18,095,511	28,315,359	5,166,315,007	182.46	1.17	814.25	29.6	1,140.94	1,745.09	843.94	28.79	67.82

to operate fast manifest freight schedules and its record for making connections is an enviable one. This kind of service requires sufficient facilities for handling it, as also supervision and operating efficiency of the highest order, and of these the Lackawanna has had both.

As will be seen from the profile, the Lackawanna has on its main line from Hoboken to Buffalo a number of rather heavy grades. The most important are those over the Pocono mountains east of Scranton and between Scranton and Clark's Summit, west of Scranton. The opposing grade to westbound operation over the Poconos begins near the New Jersey-Pennsylvania state line, there being approximately 20 miles of 1½ per cent grade, or 78 to 80 ft. rise to the mile. From Scranton east to Nay Aug, about 6 miles, operation meets a grade of 75 to 77 ft. to the mile and from Nay Aug to Gouldsboro, about 14 miles, a grade of 51 ft. to the mile. From Scranton west to Clark's Summit there is another grade of about 75 ft. to the mile for a distance of about 7 miles. There is also an opposing grade to eastbound traffic between Groveland and Wayland, about 14 miles, averaging about 60 ft. to the mile. In addition, pusher locomotives are often used by westbound trains from Lincoln Park to Port Morris, 24 miles, 51 ft. to the mile, and by trains moving eastward over the New Jersey cut-off, 28.6 miles, in which section grades are met of 29 ft. to the mile.

TABLE IV—PASSENGER OPERATING STATISTICS

Year	Passengers carried	Passengers one mile	Rev. per pass. mile cents	Average distance	Cars per train mile	Pass. per train mile	Pass. per car mile
1912	25,462,301	505,585,264	1.53	20	..	...	..
1913	25,509,047	546,308,595	1.57	21	..	...	..
1914	24,756,458	530,508,572	1.53	21	..	...	..
1915	24,014,417	528,189,133	1.56	22	..	...	..
1916	25,037,226	548,804,959	1.58	21.92	7	107	31
1917	25,307,161	585,179,118	1.59	23.12	7	117	33
1918	24,623,034	604,647,645	1.85	24.56	7	129	36
1919	27,281,789	643,253,978	1.92	23.58	7	139	37
1920	30,612,506	698,358,572	1.99	22.81	7	146	37

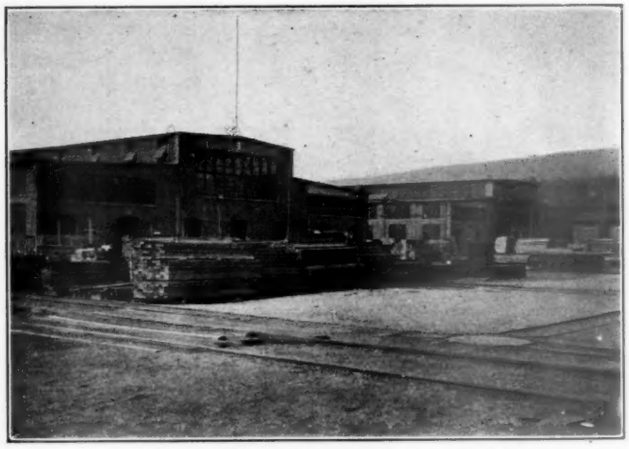
Scranton Shops

Elimination of Grades and Curvature

Naturally, in view of the fact that the line goes through mountainous country where grades of 1 and 1½ per cent are met, it is to be expected that there should also be considerable curvature. The Lackawanna, however, is characterized by the extensive projects it has undertaken to eliminate curves and in general to secure a much improved alinement. There have not only been a large number of projects embracing a few hundred yards of track, but also the noted engineering achievements which are represented in the construction of the 28-mile cut-off from Port Morris, N. J., to Slateford Jct., Pa., reducing distance between Hoboken and Buffalo by 10 miles, and the 38-mile cut-off between Clark's Summit, Pa., and Hallstead. The former work was completed in 1911 and was carried out by the Lackawanna Railroad of New Jersey, a subsidiary company on the stock of which the Lackawanna guarantees annual dividends of 4 per cent. The project cost some $11,000,000; one of its several distinguishing features is a fill some 3½ miles long, said to be the largest railroad fill in the world.

The cut-off between Clark's Summit and Hallstead was completed in November, 1915. As noted, it is 38 miles in length. It cost some $12,000,000, procured through the sale of Lackawanna stock to the stockholders at par. The cut-off reduced the distance between Scranton and Binghamton nearly 4 miles and the saving in grades and curvature was such as to cut down the time of freight trains one hour. This cut-off likewise has several distinguishing features, the principal of which is the Tunkhannock Viaduct, 2,375 ft. long and 240 ft. high, said to be the largest concrete viaduct in the world. The old line which this cut-off replaced has been abandoned and is now being made over into an automobile highway—a part of the so-called "Lackawanna Trail."

The Lackawanna has been engaged in a continued and extensive engineering improvement program of many years' duration. In addition to the two cut-offs, this program has included new yards and terminals, new shops, new stations over a large part of the system, etc. Grade-crossing elimination has received particular attention. There is not a single grade-crossing on either of the two cut-offs; there is but one grade-crossing in the city of Scranton; with the completion of the East Orange track elevation project but very few grade-crossings will remain in the suburban zone. Work is now also proceeding on the elimination of two grade-crossings at Paterson, N. J., and one at Fox Hill, near Denville.

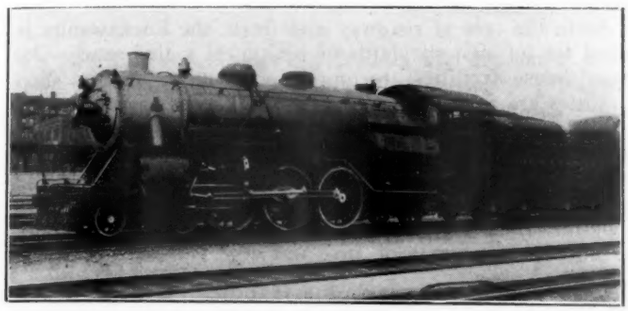


Keyser Valley Car Shops

It is such developments as these which have induced the Lackawanna to use an expression such as "Mile for mile, the most highly developed railroad in America."

In comparatively recent years, the Lackawanna's improvement program has included the elimination of grade-crossings in the New York suburban zone, new stations at Buffalo and other points, etc. During federal control, the improvement program was deferred. At present two important projects are under way. The grade-crossing elimination work in East Orange, already noted, will cost about $4,500,000. This is an elevation project; it will practically complete the program looking to the elimination of grade-crossings in the suburban zone, as above mentioned, and will facilitate train operation because of the addition of a third track as is already provided in Newark on the east, and Orange, etc., to the west.

The other project, estimated to cost about $500,000, includes the preparation of a third track for passenger operation across the Hackensack meadows between the Hackensack river and Harrison. The work, now nearly completed, consists primarily of rock ballasting, etc., and the installation of color light signals on signal bridges in place of the present two-arm semaphore signals. An outstanding feature



The Lackawanna's Passenger Pacific

of these two projects is the fact that the Lackawanna is in a position to spend approximately $5,000,000 in these times and without a bond issue. The next project in the Lackawanna's improvement program will probably be the electrification of the 1½ per cent grades between Gouldsboro and Clark's Summit, east and west respectively of Scranton.

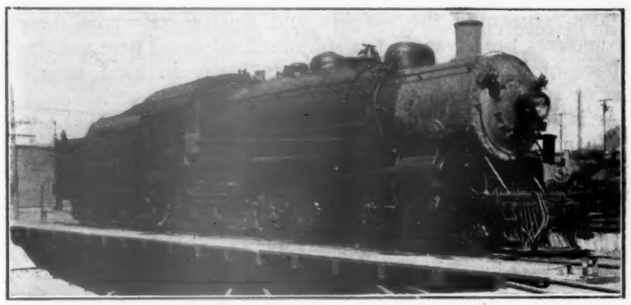
A Striking Contrast

One of the striking things about the Lackawanna is the contrast that naturally results from the carrying out of projects of such extensive character. That is to say, in some places the facilities are adequate and show provision for many years of expansion. In others the opposite is true. Mention might be made of the yard facilities at Scranton. There the road is handling 70-car manifest trains in a yard, the longest track of which will hold but 48 cars. Another instance is the Hoboken passenger terminal which has had to meet an increase in business of 40 per cent in two or three years, but with facilities used to an extent which is rapidly reaching the maximum. The general standard of excellence is so high that to the observer such things stand out in rather marked fashion.

The Lackawanna's standard rail section weighs 105 lb. to the yard. Creosoted ties exclusively have been put in main line track for some years past. Tie plates are used and screw spikes. The main line is ballasted with rock, except between Binghamton and Corning, where large-size washed gravel ballast is used. The Lackawanna has high standards of maintenance. So far in 1921 it has spent practically as much for maintenance of way as it spent up to this time last year.

Pusher and Helper Service

The average revenue train load on the Lackawanna in 1920 was 814 tons; in 1919, it was 860 tons. Considering the Lackawanna's comparatively heavy grades and the large proportion of freight which moves in manifest trains and would presumably tend to reduce the average, it might be expected that an average train loading as heavy as this is probably secured through the use of heavy motive power. This, however, is not the case. The heavy train loading is due rather to the large amount of double-heading and pusher service. In 1920 the gross tons per train mile were 1,745; the gross tons per locomotive mile, however, were but 1,141. Operation is conducted over the Poconos and from Scranton west to Clark's Summit with double-headed trains having in addition two or three and, in winter, even four pushers. There is also a considerable amount of double-heading done



The Freight Pacific Type Locomotive

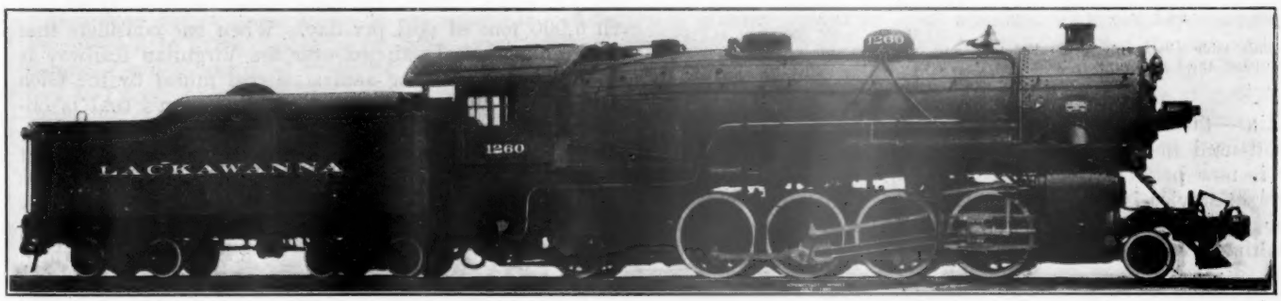
in passenger service; several of the rush-hour suburban trains are double-headed.

The Lackawanna's Locomotives

The Lackawanna's motive power standards are characteristic. This, however, is a development of comparatively recent years; even as late as 1914 through passenger trains were sometimes handled with a Ten-wheel locomotive double-headed with an Eight-wheel locomotive. Evidence of the progress that has been made up to the present time is perhaps best shown by the fact that it is hoped by next year to have applied superheaters to practically every locomotive in road service. The number of Eight-wheel and Ten-wheel locomotives in suburban service that have not been thus equipped can be counted on one's fingers.

The Ten-wheel locomotives are now being further modernized; the locomotives of this type that have been so treated compare favorably with many Pacific type locomotives. Mechanical stokers are a new development on the Lackawanna; they have been applied on about 14 Mikado locomotives and will shortly be applied to all Mikado type engines.

The Lackawanna's standard locomotives for freight serv-



The Lackawanna's Heaviest Locomotive Is a Mikado Type

This locomotive has 28 by 30 in. cylinders; a weight on drivers of 253,500 lb. and a total weight in working order, engine only, of 328,000 lb. Its maximum tractive effort is 57,100 lb. The fuel used is bituminous coal.

ice are of the Mikado (1,200 class) and of the Pacific type (1,100 class). The Mikado locomotives have a total weight in working order of from 312,000 lb. to 328,000 lb.; a weight on drivers of from 236,000 lb. to 254,500 lb. and their tractive effort is 57,040 lb., the figures varying with the various orders. The Pacific type locomotives are intended primarily for fast freight and through passenger service. The Lackawanna's Pacifics are among the heaviest of their type used on any road. Those used in passenger service have a weight of 305,000 lb. and have 72 in. driving wheels. Those used in freight service have 69 in. driving wheels; have a total weight in working order of from 288,000 lb. to 291,000 lb.; a weight on drivers from 185,500 lb. to 188,000 lb. and a tractive effort of from 40,700 lb. to 43,116 lb.

Other locomotives used in freight service include the 300 Class Consolidations; the 500 Class Moguls; the 700 Class Consolidations and the 800 Class Twelve-wheelers. General details concerning the weights and tractive effort of these locomotives are given in the subjoined table. These various classes of locomotives are used principally in local freight service and as helper or pusher locomotives.

It is interesting to notice that in the years from 1912 to 1920 inclusive the Lackawanna acquired a total of 159 new locomotives. These included 74 Mikado, 69 Pacific type and 16 Eight-wheel and 1 Six-wheel switching locomotives.

The Lackawanna is termed "The Road of Anthracite." Anthracite coal is used exclusively as fuel for passenger

LOCOMOTIVES IN SERVICE—JUNE 1, 1921

Series	Type	Class	Number in service	Total weight in working order, engine only	Weight on drivers	Tractive effort
	0-4-0	A	2	.....	.....	.....
	0-6-0	B	130	.....	.....	.....
	0-8-0	C	37	.....	.....	.....
500.....	2-6-0	E	74	176,000	153,000	30,000
300.....	2-8-0	F		180,000	166,000	34,000
700.....	2-8-0	F	244	190,000 to 178,000	169,500 to 157,500	34,197
900.....	4-4-0	G	80	159,200	106,400	23,701
1000.....	4-6-0	H	48	179,000 to 219,800	137,000 to 169,500	27,594 to 33,900
800.....	4-8-0	J	20	200,000	158,000	40,347
1200.....	2-8-2	L	62	312,000 to 328,000	236,500 to 254,500	57,040
1100.....	4-6-2	N	58	284,000 to 305,500	179,500 to 197,300	40,700 to 44,079

This table gives only general details and is not meant to be a complete record of the Lackawanna's locomotives.

trains—through and suburban alike. During the war the road used in passenger service soft coal or a mixture, but it is now back to its former standard. The coal used in freight service is bituminous exclusively. Pittsburgh No. 8, the grade used, is obtained principally from mines on the Baltimore & Ohio and the Wheeling & Lake Erie.

Freight and Passenger Cars

In the matter of freight equipment the Lackawanna has followed a conservative policy. For coal traffic the car most commonly used is a 50-ton or 55-ton steel hopper car. The box cars are mostly of 60,000 lb. and 80,000 lb. capacity and of steel underframe construction. In the years from 1912 to 1920 inclusive, the Lackawanna acquired some 7,800 new freight cars, inclusive of 800, 40-ton box and 800, 55-ton hopper cars allocated by the United States Railroad Administration.

The passenger equipment in through and suburban service alike is now largely of all-steel construction. Since 1910 the Lackawanna has acquired about 350 new passenger cars, all of all-steel construction and the most of them for suburban service.

As in the case of roadway and track, the Lackawanna is noted for its high standards of equipment maintenance. Its round-house facilities are unusually adequate and its shop facilities are rated among the best and most modern in the country. The main locomotive shops are at Scranton; the passenger car shops are at Kingsland, N. J., and the principal freight car repair shops are at Keyser Valley, not far from Scranton. With reference to the Lackawanna's stores department, it may be noted that the turnover in that department in the month of June was 40.2 per cent.

How the Lackawanna Handles Its Coal

The nucleus of the Lackawanna's business is the transportation of anthracite coal. In 1920 the road carried 10,219,848 tons of this commodity; it carried 18,095,511 tons of other freight, and the total revenue tonnage was 28,315,359. On the movement of anthracite coal, the revenues in 1920 were $20,228,484. Revenues on other freight were $40,132,599. The coal tonnage in 1920 was 40 per cent of the total revenue freight tonnage and the coal transportation revenues were 33 per cent of the total freight revenues.

The business of transporting anthracite coal is rather more different from that of moving bituminous coal than might ordinarily be expected. The distinguishing features in the case of anthracite are the very small area in which the mines are to be found, the small number of mines and the large capacity of the individual mines. Thus the Glen Alden Coal Company—or its predecessor, the Lackawanna's coal mining department—mines and ships from 9,000,000 to 11,000,000 tons of coal annually. This coal makes up some 85 per cent of the total anthracite tonnage moving over the Lackawanna.

The coal is secured from but 17 mines and one-half of it from six mines. Some of these mines produce 4,000 and even 6,000 tons of coal per day. When one considers that the bituminous coal shipped over the Virginian Railway is less in tonnage than the anthracite coal mined by the Glen Alden Coal Company, but that the Virginian's coal is obtained from some 70 mines, the contrast between the anthracite and bituminous coal business from the railroad point of view will be apparent.

The reader should also be reminded that anthracite is classified not by mines or pools as in the case of bituminous, but by sizes. These sizes are separated in the breaker which is at the head of the mine shaft. There are 8 sizes; furnace, egg, stove, chestnut, pea, buckwheat, rice and barley. The first five are domestic sizes and the latter three commercial. The size of the breaker will be perhaps best evidenced not only by the tonnage of coal which it sorts by sizes—as noted, in some cases 4,000 to 6,000 tons daily—but by the fact that a modern steel breaker costs about $1,500,000.

The Trans-Continental Freight Rate Situation*

A Presentation of the Railways' Position on Pacific Coast Rates and on Panama Canal Tolls

By Edward Chambers
Vice-President Atchison, Topeka & Santa Fe

THE TRAFFIC directly involved is the westbound movement of highly manufactured articles, practically ready for the consumer, from Atlantic ports and from points in what is known as the seaboard territory to Pacific Coast ports and to points inland from the Pacific Coast, where the ship rate to the port plus the local rail rate is less than the normal all-rail rate. There is also involved traffic from points of origin westward from Atlantic seaboard territory up to and including Colorado common points, for throughout all this region there is strong competition of manufacturers seeking markets in the Intermountain and Pacific Coast territories. The great bulk of this traffic originates or terminates on rail lines inland from the ports.

When the Panama Canal was opened in 1914 it made a through direct sailing distance between New York and San Francisco of approximately 5,000 miles and avoided all transfers en route. After the payment of tolls the Panama Canal route was still very much cheaper than any of the other water routes, and, by the uninterrupted sailings, made the all-water service much more valuable and nearer the all-rail-service than it ever was before.

The Policy of the Government

From the beginning up to 1918 the railroads enjoyed continuous permission, either by direct authority of law or ruling of the Commission, to publish rates which would enable them reasonably to meet the rates of these coast-to-coast water carriers at competitive points and continue to carry higher rates at intermediate points; and also to apply, in like manner, these all-rail water-competitive rates from points inland, such as Cincinnati, Chicago, St. Louis, Kansas City, Denver, and other points in the same territories to the same Pacific Coast competitive points.

It always has been the policy of the Interstate Commerce Commission to grant authority to apply from intermediate points of origin westward from the Atlantic seaboard territory to Pacific Coast ports the same rate that it determined necessary to meet the coast-to-coast water-carrier competition in the seaboard territory, when such rate was lower than the normal all-rail rate, and this has proven to be a very wise policy. It would be disastrous to the western manufacturing interests to prohibit such rate adjustment now, as it only assists the western manufacturer in maintaining his natural relation to the Pacific Coast territory, which relation is now seriously disturbed by the rates made via the Panama Canal route. It would also be just as disastrous to the all-rail carriers, as they would lose the Pacific Coast traffic from western points, which is the most profitable movement to them. The trans-continental railroads receive the greater benefit by applying their water competitive rates from intermediate points west of Pittsburgh.

With the opening of the European war, ships operating between Atlantic and Pacific ports began gradually to withdraw from that service and go into foreign or overseas service, which was much more profitable to them. That demoralized more or less the coast-to-coast service by water. Shortly after our country entered the war our government began to commandeer the desirable privately-owned United States ships and place them in overseas transport service. As a result the beginning of 1918 found practically no coast-to-coast water carrier operations in general domestic traffic. This condition was called to the attention of the Interstate Commerce Commission early in 1918 by intermediate shippers, and the Commission, after hearing, withdrew from the transcontinental rail carriers permission to carry the lower rates at Pacific Coast ports and obliged them to apply the Pacific Coast port rates as maxima at intermediate points. In order to protect their revenue, the rail carriers extended the maximum rates to Pacific Coast ports, which increased the rates at the ports very considerably. During 1918-1919 there was, because of the slow return of ships to coast-to-coast service, little or no competition between coast-to-coast water and all-rail carriers, and the traffic was handled almost entirely by the all-rail lines.

In the latter part of 1919 water-carrier competition by the additional ships placed in service began to show itself in a rather small way at first, but it increased gradually so that by the latter part of 1920 competition of the water routes had increased to a very considerable extent. Since then it has been steadily increasing, so that today the competition of these water lines is a very serious matter to the trans-continental rail carriers.

The all-rail carriers have up to the present time been very conservative in the matter of reducing rates to compete with the water lines. They recognize the demoralized conditions on the water and the fact that large numbers of ships are idle, there being in operation today seeking domestic traffic a greater number of ships than can be profitably operated.

With the rail lines thus practically out of the competition at Pacific ports, the intermountain shipper is in precisely the same position today that he would be if the all-rail carriers had in effect a system of competitive rates meeting the water carriers' rates, and such rates were not applied as maxima at intermediate points. But while the intermountain shipper gains nothing by the exclusion of the rail carriers from this business, the rail carriers themselves lose heavily. There is no complaint from the interior territory of the present rates of the water lines from Atlantic to Pacific Coast ports. Were the rail carriers to meet the water carrier rates at Pacific Coast ports, the present rate relationships of intermediate points to such Pacific Coast ports, based on existing combination, would not be changed. I cannot see what is to be gained by the intermediate territory if its objection prevents the all-rail carriers from meeting the rates of the water carriers. The water carriers would continue to make the same low rates to the same Pacific Coast ports regardless of the higher rate adjustment of the trans-continental railroads, which must be maintained if they are forced to carry the same rates westbound at interior points as are carried to the ports.

Competition of Markets

The cities upon the Atlantic seaboard, by virtue of the Panama Canal, secure a maximum enjoyment in the markets

*From a statement presented before Examiner William Disque of the Interstate Commerce Commission at Chicago on November 17, 1921, in behalf of all trans-continental lines in an application to the Interstate Commerce Commission for permission to make rates by the railways from the Atlantic Coast and nearby territory, from the Gulf Coast, and also from the interior manufacturing regions such as the Chicago territory, the Mississippi river territory, and the Missouri river territory to Pacific Coast points, which shall be lower than the charges on the same commodities to destinations east of the Pacific Coast.

afforded by the Pacific Coast cities. This naturally creates a market competition for the cities in the middle west from the Rocky Mountains to the Niagara frontier, which should not be denied, and under the policies of the government the all-rail carriers sought to and did establish carrying charges to the Pacific Coast cities from such interior cities upon a basis which permitted a participation in the markets of the Coast. The sections of the country in which such interior cities are located, through the medium of taxation, have contributed their full quota to the cost and the maintenance of the Panama Canal, and it is the contention of the sections and the cities in competition with the seaboard cities that the carriers should be permitted to establish a system of rates which would permit of their products or wares being placed upon the Pacific Coast on a reasonable parity with the cost of transportation so far as the seaboard cities are concerned. To deny the establishment of a basis which will permit of a reasonable participation on the part of such cities in the interior would discourage the growth and development of a very large and substantial part of the United States, and cause to be withheld from the carriers a revenue which would be theirs if the market competition of the various cities as to the traffic in question were fully considered and properly disposed of. The maximum development of country and transportation justifies a scattering of manufactories to all parts of the country rather than a concentration upon the Atlantic seaboard.

Up to the time of opening the Panama Canal the situation on the water was such as to enable all-rail lines reasonably to compete with the coast-to-coast water routes and secure a fair share of this traffic at compensatory rates; but after the opening of the Panama Canal route it became more difficult for the all-rail lines to meet the competition of these coast-to-coast water carriers. This condition forced the rates all-rail to a very low level. The reduction of cost to the ship by its not having to transfer its cargo en route and moving it all-water via the shorter, direct route, enabled the ship to make much lower rates than ever before and to reach farther inland for traffic, both at the Atlantic and the Pacific Coast, and thereby to take a greater proportion of the traffic than at any time in the past. This forced the rail rates down to a minimum figure, very close to the out-of-pocket cost of handling traffic.

If tolls on the Panama Canal were eliminated it would create a still lower basis for rates via water routes, which in turn would compel the lowering of the all-rail rates and place an additional burden on the western railroads and on western manufacturing interests. The steamship operations between Atlantic and Pacific ports have never developed any considerable amount of traffic. The bulk of the traffic which they now enjoy was developed by the all-rail lines.

Pacific Coast and Intermountain territories produce an immense volume of food products, perishable and non-perishable, such as citrus fruits, deciduous fruits, dried fruits, fresh vegetables, canned goods, beans, sugar, rice and live stock, which moves to markets east of Colorado and largely to markets in the territory east of the Mississippi River and north of the Ohio. This western territory also produces an immense tonnage of lumber which is marketed at points eastward. The rates applied to these eastern markets are not in all cases fully reasonable. Many rates have been made on the basis of what the traffic could reasonably bear in reaching markets. There is no departure from the long-and-short-haul clause of the fourth section on eastbound traffic, except sugar from California to Chicago and wool and dried hides from the Pacific Coast terminals to the eastern territory and no complaint of the relationship of rates.

The territory east of the Mississippi River and north of the Ohio produces the great bulk of the westbound tonnage of manufactured articles consumed on the Pacific Coast. The movement of traffic eastward across the Mississippi River is much heavier than the movement westward. There is always need of additional westbound traffic for loading refrigerator cars. The lumber traffic, even under normal conditions, requires a large empty movement of box cars westward. There are now owned by trans-continental lines and in service for handling perishable food products from points in Pacific Coast and Intermountain territory approximately 50,000 refrigerator cars. The character of freight generally moving westbound is desirable for loading into returning refrigerator cars, as it causes the minimum damage to the car. There is at best under normal conditions a large empty westbound movement of refrigerator cars, so that whatever increases the loading westbound contributes just that much to the net earnings of the trans-continental carriers, and, to that extent, affects favorably, from the shippers' and receivers' viewpoint, the rates both east and westbound, terminal and intermediate.

An adequate supply of refrigerator cars is important not only to the Pacific Coast territory but also to the intermountain region. The latter territory is as much interested in having the trans-continental railroads enjoy profitable operation and give satisfactory service as the Pacific Coast could be. The present rate adjustment on the traffic of western territory moving to eastern markets is low for the distance hauled in comparison with rates from other producing points. But it is necessary to carry such rates in order that western products may enter the trade in eastern markets in competition with other sources of supply. The trans-continental railroads need all the westbound traffic that it is reasonably possible for them to secure in competition with the coast-to-coast water carriers in order that they may make the rates which are indispensable to the development of western territory. The traffic most important in any section is that which it produces and ships to markets in other sections of the country. The volume on the whole shipped out of Pacific Coast and Intermountain territory to eastern markets is much greater than the inward movement.

It should not be overlooked that along the lines of the trans-continental railroads is an extensive area which produces practically no traffic, and also a very considerable territory which produces only a very light traffic. The rail lines through such regions must be largely supported by the traffic which originates or has destination beyond.

Contention of Intermediate Territory

The contention of intermountain shippers is that no lower rate under any circumstances should apply at Pacific Coast ports than is in effect at intermediate points. This contention is based largely on the effect such rates may have upon distribution by interior jobbers of eastern manufactured articles in the Intermountain territory in competition with Pacific Coast jobbers, and not to any extent on any interference with manufacturing or production at intermediate points, as the question of raw materials westbound is not involved to any extent, nor is that of the great staples, such as coal, lumber, grain and its products, fruits and vegetables, and meats.

The rail carriers have no desire to make lower rates at Pacific Coast ports than apply at interior points, if it could be avoided. They would welcome a condition which would allow them to haul a reasonable share of Pacific Coast westbound traffic under fully reasonable rates. Today the all-rail carriers have no rates in effect which meet the rates of the coast-to-coast water carriers, and there is therefore practically no competition between the carriers by rail and those by water.

If the rail carriers should be denied permission to make

lower rates at Pacific Coast ports and have higher rates at intermediate points, it would leave the water carriers without any competition except between themselves and to enjoy the haul of practically all westbound traffic to Pacific Coast ports and nearby points. The middle-west manufacturer would be unable to compete at Pacific Coast cities with the manufacturer in the territory Pittsburgh and east, who would enjoy the low water-route rates—less than the normal rates to the same points on the same commodities from the territory west of Pittsburgh, which is nearer to destination. The position of the western manufacturer in Pacific Coast markets is seriously endangered now by rates made by the coast-to-coast water carriers from eastern territory, as there are no corresponding rates made for the western manufacturer by the all-rail lines. The western manufacturer is unable to absorb the present difference between the freight rate paid by him to the Pacific Coast and that paid by his competitor from the Atlantic seaboard to the water carriers. This certainly is not in the best interest of the country as a whole. Today manufacturing is congested in the territory east of the Mississippi River and north of the Ohio, where, outside of cereal products and lumber, 85 per cent of the general manufacturing is done. What the all-rail lines are seeking to do is to hold the business from western points now on their rails and to secure a share of the traffic from the competitive eastern territory. Unless this is done the business will practically all go to the eastern manufacturers.

Water Carriers Should Be Regulated

I have always been strongly of the opinion that the rates of water carriers in coast-to-coast traffic should be under the jurisdiction of the Interstate Commerce Commission. If this were done the Commission would prescribe reasonable rates for water service which would be stable and at a figure that would enable a regular, dependable operation of steamship lines, and avoid the disturbance and demoralization caused by what is known as the tramp ship, which often offers rates for cargo at almost any figure above the handling cost and usually takes on cargo without any intention of ever returning to operate in regular service. The public gets no benefit from fluctuation in water rates caused by such competition. I believe that, with coast-to-coast rates of the water carrier subject to the Interstate Commerce Commission, there would be removed much of the cause for complaint on the part of the intermountain shippers and there would be afforded more protection to the manufacturers in western territory in their natural relation to Pacific Coast markets. Such regulation would give to the shipper on the Atlantic seaboard a reasonable rate by water, and that is all he is entitled to have.

Canal Tolls Should Be Paid

The Panama Canal cost in construction over $400,000,000. The revenues from tolls are about equal to the operating costs. The people of the western states are taxed for the original cost of the canal. By giving to seaports the free use of the canal, the entire benefit of the waterway would go to seaport cities. It is an artificial waterway, built for the protection and advantage of the country as a whole. It shortens the all-water distance between the Atlantic and Pacific coasts by 10,000 miles, and it gives to those coasts an artificial advantage in trade and commerce. Like any other facility to promote commerce, it should carry itself. It should not be the means of entirely destroying the natural advantage in mileage to the coast which the interior city possesses over the seaport.

The Application of Rail Carriers

The rail carriers have at present no relief from the requirements of the fourth section, so far as the traffic involved is concerned. They feel that they cannot longer afford to ignore this coast-to-coast water-carrier competition, as it is seriously reducing their net revenues, and they are now asking the Interstate Commerce Commission in this case to grant them permission to meet the competition of the water routes so they may enjoy a reasonable share of this westbound Pacific Coast traffic which they have built up and participated in for many years. Their application, now before the Commission, asks for permission to make rates all-rail from Atlantic Coast and nearby territory to Pacific Coast points that will reasonably meet the rates made by the water routes from the same points of origin and not to be required to apply such rates as maxima to intermediate points. They desire also to make these water-competitive rates apply from manufacturing territory west of Atlantic seaboard territory to the same Pacific Coast ports under the same relief at intermediate points.

In previous cases inquiry has been made as to what the trans-continental carriers regard as a fair share of the traffic. Manifestly this cannot be stated in percentages. We do not assume it to be the function of the Commission to determine what percentage of the business should move by rail and what by water, any more than we assume it to be the business of the Commission, where it fixed a relation between rates from two points of supply, to determine what proportion of the business shall move from one point as compared with the other. The purpose in both cases is to afford a fair opportunity for both, and let the purchaser of transportation in the first case or of the commodity involved in the second case make his own choice. As applied to the situation in hand a fair proportion is that proportion which the carrier can get upon an equality of rates.

On an equality of rates the business will divide itself according to the desires and interests of the shippers themselves. The law looks to an adjustment of rates which will encourage both rail and water competition. This provision is fully satisfied by an adjustment affording equal opportunity for both. Neither has the right to demand that the other be excluded entirely from any competitive area in which they may meet, or that from such competitive area either should be given preference through the creation of an adjustment which will increase the opportunities of one and diminish opportunities of the other. The limits of this competitive area will and should depend upon the rates which these two agencies may themselves make with some profit to themselves in free and open competition. That share which either may get under such equality of opportunity is the fair share to which it is entitled.

The rates proposed are intended to afford to the rail lines that equality of opportunity to which they think they are entitled to the extent that in their judgment traffic may be secured in competition with ocean lines at some profit. This equality of opportunity requires the extension of fourth section relief to business originating at interior producing points, at Chicago, as well as at the Coast. Competition is between the goods delivered at Pacific Coast terminal points.

In reaching its conclusions in this case, the Commission should not establish any relation between rates on traffic at intermediate points other than that established, first by the maintenance of reasonable rates at interior points and the establishment at terminal points of rates shown to be necessary to participate in business in competition with the water carriers, subject to the qualification as to cost; and, secondly, by the effect on the intermediate rates of coast combinations as maxima. The present rates at intermediate points are those which would result from the application of a rigid fourth section and have been approved by the Commission as reasonably low. They are too high to permit free movement by the rail routes to the terminal points because of the ocean competition there encountered. They should be reduced at those points to meet that competition

and for reasons in no wise affecting the traffic to intermediate points or the reasonableness of the rates under which that traffic moves. To the extent that the intermediate territory is within the zone of this influence through coast combinations, its rates would be reduced below their present levels, which is the same level as would result from the application of a rigid fourth section. There is no reason why the zone of that influence should be extended further. If the rail lines by reducing their rates could regain a part of this traffic at rates which would yield them some profit, thereby increasing aggregate net revenues, it is clear to me, that then the Commission, whose duty it is to take such steps as may be proper to promote efficient operation, should permit them to do so.

Carriers Want Commission to Announce Rate Policy

WASHINGTON, D. C.

COUNSEL for the carriers were at work during the first part of the week in preparing the form of the petition to be filed with the Interstate Commerce Commission asking for a rehearing of the Western grain rate case, and also for a general inquiry by the commission "to ascertain whether, until a substantial reduction can be secured in the labor and other costs of operation, any further reduction in rates could lawfully be required, or with due regard to the transportation industry, is possible," in accordance with the resolutions adopted by the Association of Railway Executives at its meeting in New York on November 16.

Meanwhile, the commission on Monday, November 21, issued a formal order in the Western grain rate case specifically directing the roads to put into effect the reductions named in its opinion in the case on October 20, to become effective on or before December 27. In the original opinion the commission found the reductions named to be reasonable and said that it would expect the roads to put them in effect on five days' notice on or before November 20. The commissioners probably knew as a result of their conference with the railway executives on November 12 that the carriers did not propose to put the reductions into effect, but that it was proposed to ask for a rehearing of the grain case and to substitute a 10 per cent reduction on agricultural products generally throughout the country except in New England. It is believed, therefore, that the formal order was issued to create a tangible legal status on which the roads could ask for a rehearing and it appears to be generally believed also that the commission will grant the hearing and permit the substitution of the 10 per cent cut for the larger reduction ordered in the grain case. The order directs the roads to establish on not less than five days' notice rates for the interstate transportation of wheat and hay in carloads between points in the Western and Mountain-Pacific groups, which shall not exceed the rates in effect on August 25, 1920, by more than 12½ per cent between points in the Mountain-Pacific group, 20 per cent between points in the Western group where the increase under Ex Parte 74 was 40 per cent, 17½ per cent between other points in the Western group and 16 2/3 per cent between points in the Mountain-Pacific group and points in the Western group. The carriers were also ordered to apply to coarse grains rates which shall not be in excess of 10 per cent less than the rates on wheat and rates on grain products that shall not exceed rates made by continuing the relationship that now exists between said products and the grains from which they are respectively made, except that differentials subject to the percentage increases in Ex Parte 74 shall be reduced proportionately with the rates.

While there has been no announcement of what took place at the conference between the executive committee of the Association of Railway Executives and the commissioners on November 12, it has been assumed that some sort of an informal understanding was reached between the railroads and the commissioners which, while unofficial, gives each party some sort of assurance as to what to expect from the other. It is, of course, denied that any agreement was reached, but there are indications that the discussion was sympathetic and it was stated at the time of the conference that the executive committee was to take back to New York a proposal to be acted upon by the member roads. The member roads then announced their intention of making a six months reduction on agricultural products and of asking the commission for a rehearing in the grain case and a general inquiry. The language of the resolution regarding the general inquiry leads to a belief that the railroads are hopeful that the commission, after such an inquiry, will make some general statement of what it believes will be a proper rate policy for it to follow under present conditions.

The commission has been flooded with requests for more or less general advances in rates and for a reopening of Ex Parte 74, which it has not made public, but which have been given publicity in occasional instances by the authors. Apparently a very large number of shippers throughout the country believe that there is still a chance that the commission will, by reopening Ex Parte 74, order a general reduction in rates and it has frequently been stated that a clear statement by the commission as to whether rates generally should or should not be expected to come down in the near future would do as much as any other thing to revive business, because so many people are holding off orders in the hope that rates will be reduced.

Although it is understood that the railway executives in agreeing to a reduction on agricultural products were influenced by a belief that such a reduction is more justified by economic reasons than reductions on other kinds of commodities, because the prices of agricultural products have been deflated more than those of most other articles, there has been some criticism that the carriers singled out a particular class of commodities for this reduction. For example, it has been claimed that the roads were doing so to conciliate the agrarian element in Congress that has delayed the passage of the funding bill and that has been insisting on a repeal of the rate-making sections of the transportation act. W. H. Chandler, president of the National Industrial Traffic League, has written a letter to Chairman McChord of the commission, saying that "any preferential treatment of commodities will be resented by a large mass of shippers whose rates are still at the highest war peak." He has also telegraphed to Chairman Cuyler of the executives' association, saying that whatever reduction is made should be applied generally without discrimination just as the advances were applied.

THE UNITED STATES POSTOFFICE DEPARTMENT has been devoting particular attention to the "perfect package" campaign, along with the express and railroad companies. Employees of this department are putting forth every effort to induce mailers and shippers to give more attention to the manner in which their goods are packed, the kind of containers used, and the writing or marking of adequate and legible addresses.

TWENTY-SIX PEOPLE KILLED, 190 injured and 586 automobiles destroyed is the grade crossing record on the Southern Pacific for the past nine months. Nearly 300 drivers ran in front of or tried to beat the train to the crossing; 126 ran into trains, instead of trains striking them; 76 stalled on the track, largely the result of waiting until on the track before shifting gears; 55 ran into and broke down crossing gates; 28 approached the track at high speed, and five ran down and injured crossing flagmen.

Galewood Yard, Chicago, Milwaukee & St. Paul

The Use of Wood in Freight Car Construction

Is the General Use of All-Steel Construction Justified? The Advantages of Composite Design

By H. S. Sackett
Assistant Purchasing Agent, Chicago, Milwaukee & St. Paul

THE MOST IMPORTANT feature of transportation in relation to commerce is naturally the freight traffic; thus, in the evolution of steam locomotion the problem always has been the construction of freight cars to meet the requirements of economic operation. From the first type of horse drawn freight car operated on the Baltimore & Ohio, antedating the steam locomotive and moved over timber rails, to the present quasi-standard 100,000-lb. capacity box car designed during the war, wood has maintained its important place because of its inherent suitability for the purpose which has been indisputably established not alone by its service record during the nearly 100 years of railroad history, but ever since merchandise was first transported on sleds; even before the invention of wheels.

A growth from 35 miles of railroad in 1835 to a total of 370,000 miles in 1918, and the development from locomotives of 15½ tons previous to 1850 to the electric "King of the Rails" of 1920 weighing 550,000 lb., and the Santa Fe type weighing over 400,000 lb., are graphic illustrations of progress fully comparable with the unprecedented commercial advance of the United States during the same period.

Developments in Car Construction

Car construction cannot boast of such intense application. Looking back through this phase of railroad history one can hardly escape the impression, that generally speaking, freight cars "just grow'd" like Topsy, at least up to about 20 years ago when the pendulum started on the swing toward the present extreme of super-heavy construction.

In 1867 the Master Car Builders' Association accepted 20 tons as the maximum capacity of box cars. Today the indications are that cars of 100,000 lb. capacity will soon be the standard. These changes naturally made obsolete the older types of equipment as the lighter construction became entirely inadequate to meet the requirements of modern traffic. Thus was developed the quasi-standard type of steel underframe construction as typified by the double-sheathed box car, developed during the past three years.

At the present time, to go beyond this to the all-steel closed-top freight car is hardly good, conservative engineering practice. All-steel cars can, at best, be considered but experimental, as only about ten years of worth-while experience has been had with such equipment and during this period such authentic evidence as is available points to excessive maintenance as compared with composite cars.

Up to this time, furthermore, the steel car has been developed mainly by the railroads which serve the steel districts, and this fact is undoubtedly responsible for their ultra-development by such roads. Likewise, railroads traversing forested regions have held more closely to the wooden or composite cars. The desire to aid in marketing a local product, therefore, has doubtless been a strong factor in the development of the all-steel car.

In this connection too it is of interest to note the recent announcement of the Pullman Company of a return to the composite sleeping car, one of steel understructure with steel skeleton superstructure insulated and finished with wood. This combination makes a safe, strong and comfortable car and one which is certainly superior in all respects to the all-steel type.

In 1918, Z. B. Wilson, of the Southern Railroad, in the Railway Review stated, "Nothing has occurred in the past decade that would justify spending $2,500 for an all-steel box car, while we can build a composite box car with a substantial steel underframe, with superstructure and ends reinforced with steel for $1,250. The writer desires to say * *, that he is very much in favor of composition cars for the following reasons: (1) A greater proportion may be re-

paired at other than steel car shops; (2) the initial cost is less; (3) the cost of maintenance is less than half of all steel; (4) the sides do not bulge as those of all steel; (5) composite cars can be repaired in half of the time required for the all-steel, thereby materially increasing car efficiency."

However, this controversy is not new. In 1870 the first earnest discussion of the steel car is recorded in the proceedings of the Master Car Builders' Association for that year. About thirty years later we find the fruition of these debates and early studies in the steel center sill, to be followed by the all steel underframe, both of which are justified by experience, but like many reforms that are aimed to achieve perfection over night there seems to be no happy medium and we are now presented with *all steel everything*. There is one consolation in this all-steel craze, that our inbred respect for cattle and hogs, which evidently outweighs consideration for mere human comfort, will prevent the all-steel stock car.

The demands made upon freight carrying facilities have entailed changes in construction to meet new requirements. Among these factors is the high speed with which trains of great tonnage are today moved across the continent. Tractive effort has increased 3,000 per cent and with the increased cost and scarcity of labor has come fly-switching and the hump track. It would be unreasonable to expect the all-wood cars of 20 to 30 tons capacity, weighing between 22,000 lb. and 27,000 lb. and in their prime during the last decade of the nineteenth century, to meet these changed conditions. Efficiency dictates scrapping such equipment and its replacement with modern construction designed to withstand the wear of present traffic. Maintaining obsolete rolling stock is wasteful, and when certain roads spend roughly as high as 35 per cent of the total value of their rolling stock for its maintenance and repair in one year, it is time to establish with positive clarity just how much may be expended for maintenance with safety to financial soundness.

Relative Advantages of the Double and Single Sheathed Box Car

So far, all-steel equipment has not been proved to be the most economical. No attempt is made to prophesy future developments, but with a design adopted which meets all present and future requirements within the range of vision, sound conservation compels the building of the largest number of freight cars for the least money in order to rehabilitate transportation facilities and avoid the serious difficulties and losses occasioned yearly by lack of cars.

However, aside from the matter of expediency and present financial considerations the steel underframe, wood superstructure double-sheathed car (in some cases with metal carlines and steel ends for closed-top cars) presents physical and economic advantages, which quite distinctly identify it as the most suitable for modern conditions. These advantages may be summarized as follows:

(1) It is sufficiently rigid to withstand modern mechanical shock.

(2) It is adaptable to special conditions of lading, climate and traffic, varying with the respective territory involved, without sacrificing the standard interchangeable features of the steel substructure, trucks, draft rigging and appliances.

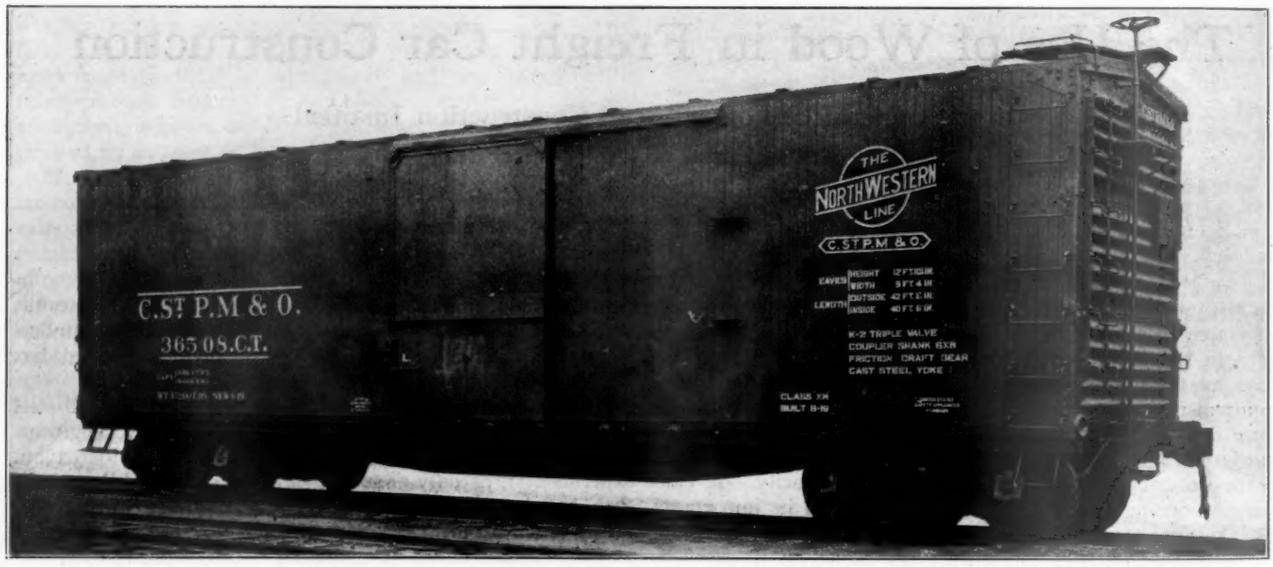
(3) It may be fully assembled at railroad shops, from materials (such as the lumber for superstructure) often locally available.

(4) Trained labor is more available and less costly, and can be more evenly distributed than were the construction of all steel cars concentrated in the present manufacturing centers, which alone can most economically produce the all steel car.

(5) Repairs can be made more rapidly, at less cost and at any repair yard.

(6) It provides greater protection to a majority of the various classes of lading.

(7) It is more readily suited to interchanges as it meets most effectively the requirements of climatic extremes encountered within the four boundaries of the continent.



Railroad Administration Double-Sheathed 40-Ton Box Car

(8) The initial cost is less. Although the reproduction value (M. C. B. Rules, 1920) is approximately nine per cent less than that of the all steel car the difference in first cost invested at six per cent compound interest for 20 years, still gives the composite car an advantage of five per cent after deducting such loss, providing maintenance of the all steel car is not greater than that of the steel underframe and wood superstructure car.

(9) The depreciation (M. C. B. Rules, 1920) is the same as for the all steel car, namely three per cent.

(10) Shippers prefer wooden superstructure as packing of lading is more convenient and less costly, because precaution need not be taken against rusted side sheets, bulging ends, condensation from roofs, or leaks of bulk lading occasioned by holes in corroded plates.

(11) It is lighter by upwards of 1,000 lb. and therefore costs less to haul.

The single-sheathed, steel superstructure outside frame car must likewise suffer by comparison with the double-sheathed car. Its chief weaknesses are unsightliness after short usage, due to the unavoidable perforating with nail holes of the single thickness of longitudinal siding, as well as the consequent exposure of lading. Where such cars are

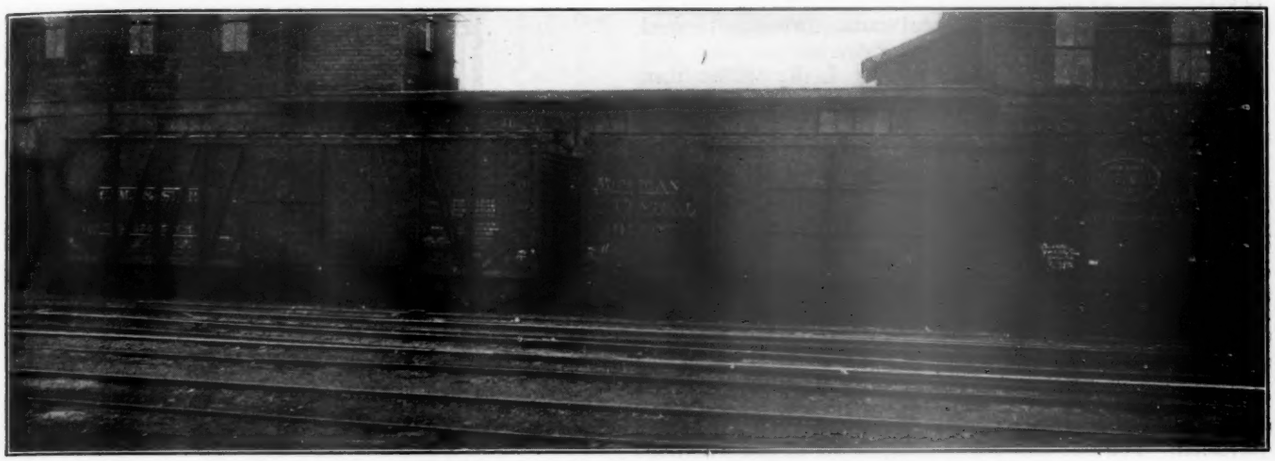
used for valuable or semi-perishable freight, extra packing is required, and in some instances cars must be sheathed with tarred felt or waterproof paper by shippers; hence, the general unpopularity of this type of car. For such ladings as bricks, paving blocks, castings, etc., it will do unless because of poor loading the heavier pieces go through the side, or break up the siding. In addition, the first cost is greater, and the saving in volume of lumber used is offset by the higher cost of the grade and dimension required.

An average single sheathed car would require about 1,500 board feet of 1¾-in. (rough 2-in.) dressed select, B and better, Southern pine sheathing; the double sheathed car requires about 1,700 board feet, No. 1 common, 13/16-in. lining and 13/16-in. B and better siding. The difference in quoted prices (September 1920) equals a saving of $22.50 a car, which at 6 per cent compound interest during an average life of 20 years would represent $72.15 per car. If applied to 100,000 box cars of the type recently ordered, this would amount to about $7,215,000, enough to add over 2,000 double sheathed cars to the present equipment.

Whether the steel frame superstructure adds sufficient strength to the car, or materially increases its durability is largely guess work—a prophecy of future occurrences which the future alone can answer. At present it has not emerged from the experimental stage. Therefore, the problem is again one of comparative initial cost, and the known service of the wood superstructure against the problematical performance of the steel frame.

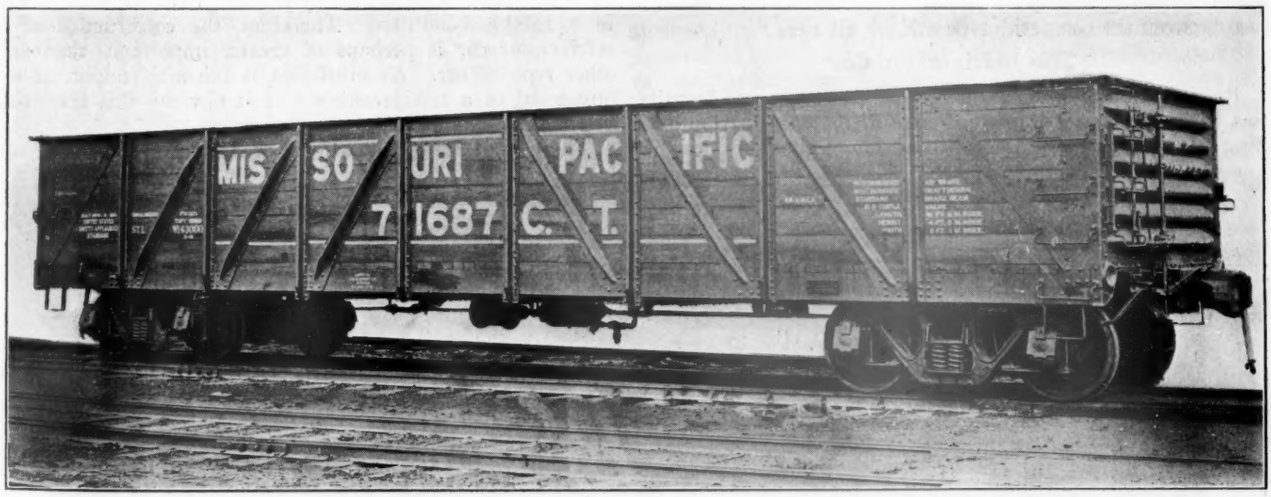
The Composite Gondola Car

Our discussion thus leads us to other types of cars, particularly, gondola, flat, stock and refrigerator cars. The latter are by their nature excluded from the possibility of all-steel construction. Gondola, coal and ore cars present different problems, but there is no question that the all-steel gondola still requires considerable development before it can be considered as a successful type. Flat cars are on the wane. Other types, such as tank cars and logging cars, are largely of private ownership and represent a comparatively small percentage of the total freight equipment, and do not materially affect the general question of efficiency in car construction.



Modern Single-Sheathed, Steel Frame and All-Steel Box Cars

Longer experience with all-steel gondola cars, particularly where used in bituminous coal service, indicates that depreciation is greater, maintenance more costly, and that they are consequently less economical than the composite car. In an article already referred to, Z. B. Wilson states that "the Southern Railway is operating a large number of both types (composite and all-steel coal cars) which were built in 1904 and 1905. These cars have been used almost exclusively in transporting coal. Both types are double hopper, and 100,000 lb. capacity. The average cost of repairs to 20 all-steel



Composite Gondola Car

cars was about $666.31 while the average cost on the composite cars was $240.97."

The Railway Mechanical Engineer of May, 1917, quotes the conclusions of William Queenan, assistant superintendent of shops, Chicago, Burlington & Quincy, as follows: "The composite type of car costs less to maintain than the steel gondola. The sides of composite cars do not bulge as do those of the steel car. Records show that while the composite car costs more to repaint than the steel car, it does not require painting as frequently. A large portion of the repairs to composite cars can be taken care of at other than steel car shops. Certain properties of coal cause corrosion to steel but do not affect wood."

In discussing freight car maintenance, L. K. Sillcox, then mechanical engineer of the Illinois Central, in the Railway Mechanical Engineer, October, 1917, stated: "It is simply a question of time until the greater part of a steel car must be replaced; renewals can only be economically and quickly carried out on a large scale for each car for the reason that corrosion is more or less uniform throughout each section of the structure and one part cannot be disturbed without equally effecting the adjacent one. As steel cars advance towards the time of their periodical overhauling many fail in service due to deterioration . . . ."

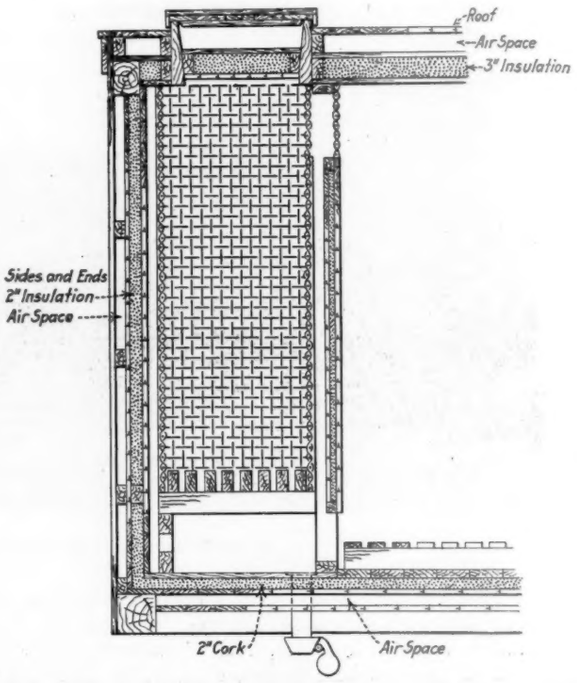
Every road having steel equipment has had to deal with these conditions during the past decade. Even the most enthusiastic steel car men are now contemplating heavier construction and employing specially treated metal to counteract corrosion. The question again forces itself to our attention whether following this costly mirage much further is good practice when composite cars have proved their worth.

Stock Cars

There can be no question that the composite stock car is both the most economical and most suitable. The wood superstructure presents sufficient protection to the lading and also a degree of comfort for the animals. There is the added advantage that all the wood in the superstructure may be thoroughly treated to make it both rot and vermin proof, and this feature permits the selection of lower grades of lumber which naturally adds considerably to the initial difference in cost between the composite type and an all steel car.

The Refrigerator Car

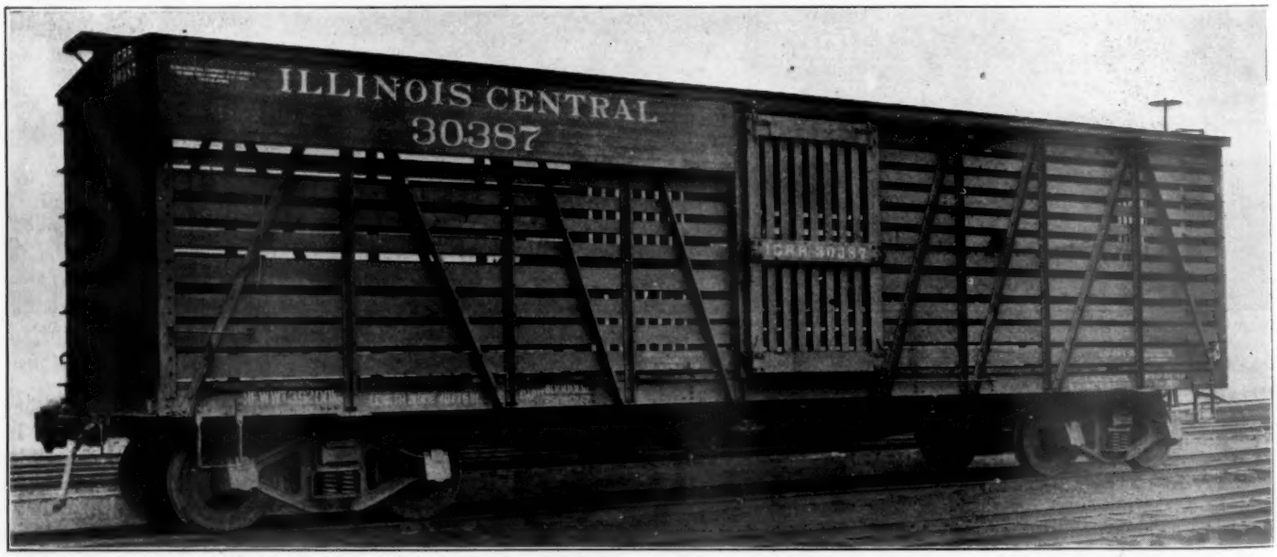
Refrigeration of food products, both in storage and transit, has become the most important element in food distribution. Properly developed and applied, it unquestionably lessens the average cost of food products and provides a normal flow of supplies to the nonproducing urban population, from the reserves accumulated from the surplus of seasonal production. Transporting perishable commodities in perfect condition would contribute greatly in cheapening the most necessary food products. Every dozen of eggs and each pound of meat, butter, fruit or vegetables spoiled in transit naturally



Longitudinal Section of Department of Agriculture Design of Refrigerator Car Insulation

increases the cost in proportion to the decrease in supply, as such loss must be equalized by higher prices for what is left in a salable condition. Therefore, the construction of a refrigerator car is perhaps of greater importance than any other type of car. As insulation is the most important requirement of a refrigerator car it is obvious that the wood body cannot be replaced.

The United States Department of Agriculture has done ad-



Modern Type of Stock Car Construction

SUGGESTIONS FOR LUMBER GRADES AND DIMENSIONS FOR NEW CARS AND REPAIR WORK

NEW CARS

	Siding		Roofing		Lining		Decking		Framing	
	Grade	Size, inches	Grade	Size, inches	Grade	Size, inches	Grade	Size, inches	Grade	Size
Box { Double sheathed	B and Better	1 by 4 or 6	B and Better (outside)	1 by 4 or 6	No. 1 Common	1 by 4 or 6	No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
Box { Single sheathed	B and Better or Select, sap stain, no defect.	1 by 4 or 6	B and Better (outside) No. 1 Common (inside)	1 by 4 or 6			No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
Refrigerator	B and Better	1 by 4 or 6	B and Better (outside) No. 1 Common (inside)	1 by 4 or 6 1 by 4 or 6	B and Better	1 by 4 or 6	No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
							No. 1 Common, for sub-floor.	1 by 4 or 6	No. 1 Common, sq. edge.	As specified.
Stock	B and Better		B and Better (outside) No. 1 Common (inside)	1 by 4 or 6 1 by 4 or 6			All heart or No. 1 Common, treated.	2 or 2½ by 6 or 8		
Gondola	Sq. edge and sound.	50 per cent full lengths 50 per cent spliced					Sq. edge and sound.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.

REPAIR WORK

Double sheathed	No. 1 Common	1 by 4 or 6	B and Better (outside)	1 by 4 or 6	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
			No. 2 Common (inside)							
Single sheathed	No. 1 Common, sap stain, no defect.	2 or 2½ by 6 or 8	B and Better (outside)	2 or 2½ by 6 or 8	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
			No. 1 Common (inside)							
Refrigerator	No. 1 Common	1 by 4 or 6	B and Better (outside)	1 by 4 or 6	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
			No. 2 Common (inside)							
Stock	No. 1 Common		B and Better (outside)	1 by 4 or 6			All heart or No. 1 Common, treated.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
			No. 2 Common (inside)							
Gondola	Sq. edge and sound.	50 per cent full lengths 50 per cent spliced					Sq. edge and sound.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.

mirable work in its investigations into the subject, covering a period of over 15 years. Its efforts have finally resulted in a so-called standard refrigerator car, as represented by specifications formulated by the recent Railroad Administration. The conclusions arrived at by these exhaustive studies and the desirable features of an efficient refrigerator car were referred to in detail by Dr. M. E. Pennington, connected with the Food Research Laboratory, Bureau of Chemistry, United States Department of Agriculture, in a brochure in which are compiled a number of papers dealing with this subject.

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Passenger equipment if discussed in proper detail is worthy of special treatment, and is largely a question of combining safety with comfort. Careful analytical review of the entire problem indicates that the most economical passenger car for use under present conditions is one of strong steel underframe with steel skeleton superstructure, insulated and finished with wood. It is believed that such construction will give the maximum safety in the present heavy trains as well as a high degree of personal comfort to the passengers.

Greater Economy in Use of Wood

"Familiarity breeds contempt," is an oft repeated truism and possibly this explains the lack of more active interest on the part of car builders in the matter of using wood more economically and securing from it longer service in car construction. Ever since the first freight car—a hundred years ago—wood has been an inseparable and indispensable part of car construction, and because it was plentiful in the past and the best grades readily and cheaply available as was labor for repairs, little or no care has been used to protect it against the natural conditions of deterioration. All failures to this day are classed as mechanical where fully half of the light repairs could be avoided or retarded by employment of practical remedial measures.

On the basis of consumption previous to the war one and one-quarter billion board feet in round numbers were used for car construction annually, or about 3 per cent of the total annual production. This represents an average value of nearly $45,000,000 at normal prices. A saving of about 25 per cent through increased service and decreased repairs would be a goodly item in addition to being real timber conservation.

Thus, in addition to the suggestion that elimination of wood in car construction is neither desirable nor practical, it may be said that lumber may be used more economically by paying closer attention to selection of grades and dimensions which fully answer the purpose but are cheaper, and protection of the lumber against such agencies as decay, insects, checking while in storage, etc. Timber conservation is vital to the nation, and most especially to the railroads, who, because of their prominent position, are obligated to lead in economic movements which are so potent in their beneficial influence. The basic principle of economic utilization—or popularly interpreted, timber conservation—underlies these suggestions of changes in specifications for car lumber which,

cars was about $666.31 while the average cost on the composite cars was $240.97."

The Railway Mechanical Engineer of May, 1917, quotes the conclusions of William Queenan, assistant superintendent of shops, Chicago, Burlington & Quincy, as follows: "The composite type of car costs less to maintain than the steel gondola. The sides of composite cars do not bulge as do those of the steel car. Records show that while the composite car costs more to repaint than the steel car, it does not require painting as frequently. A large portion of the repairs to composite cars can be taken care of at other than steel car shops. Certain properties of coal cause corrosion to steel but do not affect wood."

In discussing freight car maintenance, L. K. Sillcox, then mechanical engineer of the Illinois Central, in the Railway Mechanical Engineer, October, 1917, stated: "It is simply a question of time until the greater part of a steel car must be replaced; renewals can only be economically and quickly carried out on a large scale for each car for the reason that corrosion is more or less uniform throughout each section of the structure and one part cannot be disturbed without equally effecting the adjacent one. As steel cars advance towards the time of their periodical overhauling many fail in service due to deterioration . . . ."

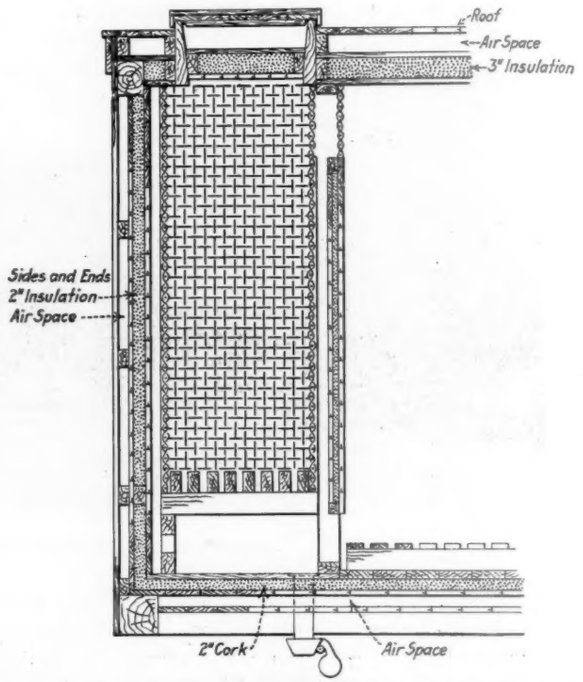
Every road having steel equipment has had to deal with these conditions during the past decade. Even the most enthusiastic steel car men are now contemplating heavier construction and employing specially treated metal to counteract corrosion. The question again forces itself to our attention whether following this costly mirage much further is good practice when composite cars have proved their worth.

Stock Cars

There can be no question that the composite stock car is both the most economical and most suitable. The wood superstructure presents sufficient protection to the lading and also a degree of comfort for the animals. There is the added advantage that all the wood in the superstructure may be thoroughly treated to make it both rot and vermin proof, and this feature permits the selection of lower grades of lumber which naturally adds considerably to the initial difference in cost between the composite type and an all steel car.

The Refrigerator Car

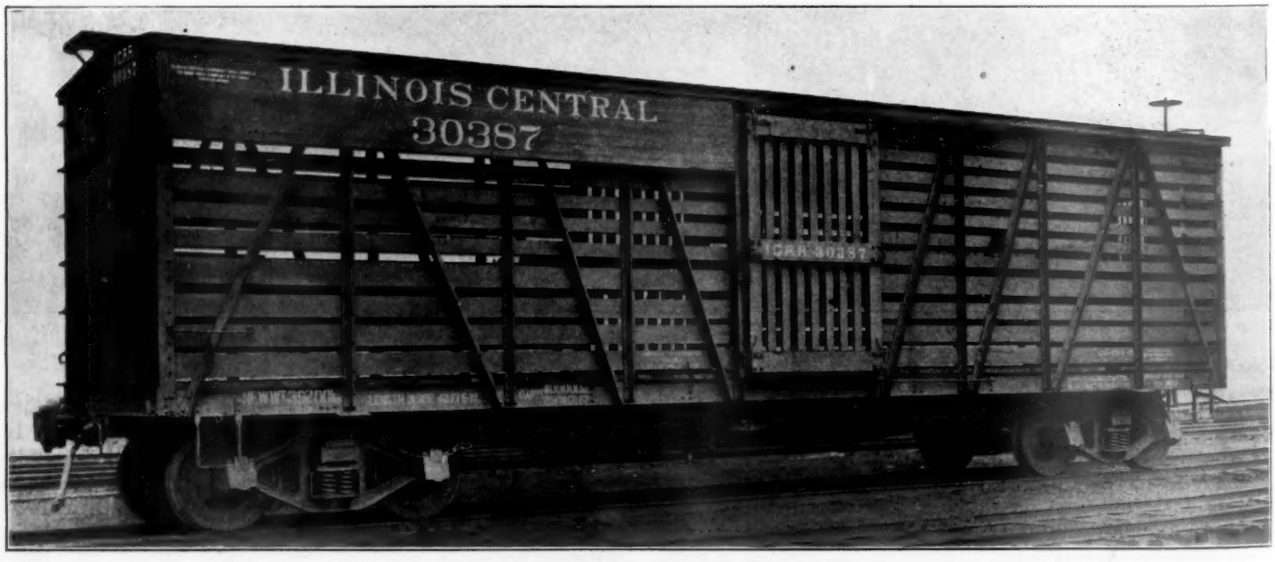
Refrigeration of food products, both in storage and transit, has become the most important element in food distribution. Properly developed and applied, it unquestionably lessens the average cost of food products and provides a normal flow of supplies to the nonproducing urban population, from the reserves accumulated from the surplus of seasonal production. Transporting perishable commodities in perfect condition would contribute greatly in cheapening the most necessary food products. Every dozen of eggs and each pound of meat, butter, fruit or vegetables spoiled in transit naturally



Longitudinal Section of Department of Agriculture Design of Refrigerator Car Insulation

increases the cost in proportion to the decrease in supply, as such loss must be equalized by higher prices for what is left in a salable condition. Therefore, the construction of a refrigerator car is perhaps of greater importance than any other type of car. As insulation is the most important requirement of a refrigerator car it is obvious that the wood body cannot be replaced.

The United States Department of Agriculture has done ad-



Modern Type of Stock Car Construction

SUGGESTIONS FOR LUMBER GRADES AND DIMENSIONS FOR NEW CARS AND REPAIR WORK

NEW CARS

	Siding		Roofing		Lining		Decking		Framing	
	Grade	Size, inches	Grade	Size, inches	Grade	Size, inches	Grade	Size, inches	Grade	Size
Box { Double sheathed	B and Better	1 by 4 or 6	B and Better (outside)	1 by 4 or 6	No. 1 Common	1 by 4 or 6	No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
Box { Single sheathed	B and Better or Select, sap stain, no defect.	1 by 4 or 6	No. 1 Common (inside) B and Better (outside) No. 1 Common (inside)	1 by 4 or 6			No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
Refrigerator	B and Better	1 by 4 or 6	B and Better (outside) No. 1 Common (inside)	1 by 4 or 6 1 by 4 or 6	B and Better	1 by 4 or 6	No. 1 Common, sq. edge.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.
							No. 1 Common, for sub-floor.	1 by 4 or 6	No. 1 Common, sq. edge.	As specified.
Stock	B and Better		B and Better (outside) No. 1 Common (inside)	1 by 4 or 6 1 by 4 or 6			All heart or No. 1 Common, treated.	2 or 2½ by 6 or 8		
Gondola	Sq. edge and sound.	50 per cent full lengths 50 per cent spliced					Sq. edge and sound.	2 or 2½ by 6 or 8	No. 1 Common, sq. edge.	As specified.

REPAIR WORK

Double sheathed	No. 1 Common	1 by 4 or 6	B and Better (outside) No. 2 Common (inside)	1 by 4 or 6	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
Single sheathed	No. 1 Common, sap stain, no defect.	2 or 2½ by 6 or 8	B and Better (outside) No. 1 Common (inside)	2 or 2½ by 6 or 8	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
Refrigerator	No. 1 Common	1 by 4 or 6	B and Better (outside) No. 2 Common (inside)	1 by 4 or 6	No. 2 Common, sound knotted	1 by 4 or 6	No. 1 Common.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
Stock	No. 1 Common		B and Better (outside) No. 2 Common (inside)	1 by 4 or 6			All heart or No. 1 Common, treated.	2 or 2½ by 6 or 8	No. 1 Common.	As specified.
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being sound, bring with them profit in the form of equivalent service at a saving in cost of material and maintenance.

Standardization has proceeded to where there is practically a standard covering grades and dimensions for the various parts of cars, such as siding, lining, roofing, decking, framing, etc. These standards, however, have not taken full cognizance of the frequent difficulties manufacturers encounter in endeavoring to conform their practices accordingly, or their utter inability to do so. The manufacturer of lumber is limited entirely by the manner in which nature provides the raw material, or rather, how the trees grow. Lumber cannot be cast in a mold, nor can it be forged to a drawing. Yellow pine, however, is produced in sufficient variety of grades and sizes to provide perfectly good car lumber quite plentifully if reasonable flexibility is allowed with regard to dimensions.

A large yellow pine mill questioned on the matter replied, "On account of the great number of patterns required by car builders, this mill has never attempted to supply any of this material, as we have found that it required too much special work and too much cutting loss." Loss is waste of material and money, because it must be paid for; its elimination therefore, means economy and conservation.

One of the fundamentals of standardization is to adapt available supplies to the required conditions, thus widening the market of supply by standardizing manufacture and developing economies that effect a reduction in production costs, resulting in stimulating competition and lower prices.

Another manufacturer suggested, "The greatest possible service that could be rendered the car builders and lumber manufacturers would be to adopt a single pattern that would serve for car siding, car lining and car roofing, and then make this pattern in standard lengths; that is to say, all lengths, using what would cut up to best advantage for roofing and siding, and the lengths that would not cut up, on the inside of the car as lining."

Where would the cost of lumber for common building purposes be, and how much greater would be our loss in timber devastation and waste if the present standards had disregarded the availability of the grades and dimensions specified? In drawing specifications for building lumber the dominating factor is to produce the greatest volume of usable stuff at the lowest cost and with the least waste. Reforms are still possible in that field and improvements are frequently accepted.

Specifications for car lumber have changed slightly during the last 50 years, but if the progress were more in line with the conditions manufacturers must contend with in order to supply the lumber to meet some of the most stringent requirements, freight cars might be a little cheaper and at least a greater volume of suitable material would be more generally available. Some builders are more concerned with appearances than with the service to be rendered. A knot in a piece of siding can cause as much comment from a railroad president as a buckled-up steel car.

On the other hand, it is equally as important that the railroad engineers be allowed the opportunity of saying what grade and quality of material will be needed to meet their requirements. If the producers and consumers of wood used by the railroads in car construction, therefore, could thus get together on common ground, it is believed standard grades could be developed which would represent a big step of progress toward both conservation and utility—meeting the contingencies of the lumber manufacturer on the one hand and the exacting needs of the railroad engineer, on the other.

CLEARLY, if by our investments abroad and our purchases of foreign goods, we can help to provide the world with the means to pay for our raw materials, our food, and our manufactures, the course of trade will soon be quickened.—*Guaranty Survey.*

Railroad Securities Bill Postponed Again

WASHINGTON, D. C.

THE BILL to authorize the government to sell its railroad securities, taken from the railroads for additions and betterments made during federal control, has been forced over into the next session of Congress, which begins on December 4, because of the extent of the opposition to the bill by those who wish to embarrass the railroads in any way possible as well as by those who proposed to use the bill as a vehicle for amendments to the transportation act designed to bring about reductions in rates. Senator Cummins, who after having had the bill made the unfinished business of the Senate and after all the committee amendments had been adopted in committee of the whole, allowed it to be displaced by the Newberry-Ford election controversy, announced on November 17 that he had given up his efforts to have it passed at this session.

A number of proposed amendments to the bill were mentioned in last week's issue. On November 18 Senator Hitchcock of Nebraska proposed an amendment which he had drafted several days before to provide that the act should not take effect unless and until the railroads shall put into effect the reduction of freight rates on grain, grain products and hay in the west as required by the findings and decision of the Interstate Commerce Commission of October 20. At the time this amendment was proposed the railroads had not filed the grain tariffs which to become effective on November 20 should have been in by November 15, but had announced their intention of substituting a 10 per cent reduction on agricultural products and of asking a rehearing in the grain case. On November 19 Senator Ransdell of Louisiana also submitted to the Senate a proposed amendment providing that no portion of the fund arising from the sale of the railroad securities shall be used to settle with those carriers which have preferential contracts with foreign ship companies, so long as the contracts continue in force.

A number of senators who have no particular objection to the railroad securities bill are very anxious to vote for a bill to repeal the rate-making section of the transportation act, while some who are in favor of the repeal in something like the form of the Capper bill, on which the committee on interstate commerce has been holding hearings, would prefer to take up such legislation in an orderly way instead of dealing with it as a rider on the so-called "funding" bill. Chairman Cummins of the interstate commerce committee has been anxious to pass the "funding" bill and he has also expressed himself as possibly inclined to be in favor of restricting somewhat the power of the Interstate Commerce Commission to change state rates, but he does not believe in combining the two subjects. He has not expressed himself very definitely as to the 6 per cent rate-making provision, but he did say during a hearing that perhaps it was now immaterial as the 6 per cent provision expires on March 1.

Although the President has said on several occasions that he hoped for the passage of the bill at this session, it was stated at the White House on Tuesday that he does not now care particularly about its passage at this time, because market conditions are now such that it is possible to sell car trust certificates and go ahead with the settlements with the railroads one at a time, so that if Congress is not ready to act that fact constitutes no present hindrance to the program. Additional sales of the car trust certificates were made last week and on November 21 additional sales amounting to $4,911,900 were announced. The purchasers were Salomon Bros. & Hutzler and Kidder, Peabody & Company. This makes a total of $114,250,700 certificates sold to date, but the total amount of the certificates is not sufficient to complete the settlements.

M. K. & T. Reorganization Plan Announced

Common Stock Without Par Value Contemplated. Fixed Interest Charges Reduced to $4,917,717

REORGANIZATION managers of the Missouri, Kansas & Texas Railway Company, J. & W. Seligman & Co. and Hallgarten & Co., have completed the definite plan for the reorganization of the property, which has been accepted by directors of the company and the 18 committees representing securities dealt with under the plan. The plan was formally announced on Tuesday. The stockholders' participation in the plan is to be underwritten by a syndicate which Speyer & Co., J. & W. Seligman & Co., Hallgarten & Co., and the Equitable Trust Company have undertaken to organize. The plan is to be declared operative by the reorganization managers when in their judgment a sufficient amount of securities has been deposited.

Preparation of this plan has probably involved dealing with more numerous interests than any reorganization since that of the Southern Railway in 1894. The road consists of 1,553 miles of main line and 1,590 miles of branches, a total of 3,143 miles of road, exclusive of 229 miles used under trackage agreements. It has been in receivership since September, 1915, in which year the old company failed in its efforts to refund $19,000,000 short term notes, although it had continuously earned its fixed charges. Active plans for reorganization were interrupted by the war and federal control.

Outstanding Features of Plan

The outstanding features of the plan include the following:

(1) Reduction of the fixed interest bearing debt of the railroad from $146,543,142 to $100,320,913, and of the fixed interest charges (including sinking fund payments) from $7,429,376 to $4,917,717. In addition, the new company is to have $57,500,000 5 per cent convertible adjustment mortgage bonds bearing a contingent interest charge of $2,875,000, cumulative from January 1, 1925.

(2) Total capitalization of the old company, stocks and bonds, of $248,095,000 to be replaced by the new company's bonds and preferred stock aggregating $182,320,000 and 783,155 shares of its common stock without par value.

(3) Assessments of $20 per share on the $13,000,000 old preferred and $25 per share on the $63,283,257 old common to provide $18,420,000 new cash for reorganization purposes, of which $4,042,000 is to be used to pay off receiver's certificates and bank loans, $1,275,000 to pay deferred interest under the plan, $1,000,000 to meet next year's equipment trust maturities, $4,000,000 to provide the new company with a working balance, and $8,103,000 is reserved for additions and betterments, and the expenses of reorganization.

The financial structure of the old company was such that the reorganization plan has had to deal with the owners of 18 bond and two stock issues. Small issues aggregating $7,247,951 are left undisturbed. Some idea of what the plan will accomplish toward simplifying and solidifying the road's financial organization may be had from the fact that it reduces 18 bond issues to two, except to the extent that holders of bonds issued under the old first mortgages, which are not foreclosed, do not elect to deposit them under the plan. Except for that contingency, the new prior lien bonds will be substantially a first mortgage on the entire system, including terminals and rolling stock. That is true of few existing railroad mortgages.

Treatment of Existing Securities

For each $1,000 of principal of and interest accrued on existing securities, the plan offers new securities and cash as shown in the accompanying table:

Holders of the existing preferred stock, on payment of $20 a share, of which $8 is to be paid at time of depositing the old stock, and the remainder in three equal installments at intervals of not less than 30 days, are to receive per share

Existing securities	Maturity	Principal amount outstanding Dec. 31, 1920	Prior lien mortgage bonds, 5 per cent	Prior lien mortgage bonds, 4 per cent	Adj. mortgage bonds, 5 per cent	Preferred stock	Common stock (number of shares)	Cash
MISSOURI, KANSAS & TEXAS RAILWAY CO:								
First mortgage 4 per cent gold bonds	1990	$39,999,500	$500	$500	.....	.....	.....	$23.33
Second mortgage 4 per cent gold bonds	1990	20,000,000	...	...	$1,192.50	$64.16	.....	.....
First and refunding mortgage 4 per cent gold bonds	2004	9,992,000	500	250	503.33	.....	.....	.....
General mortgage 4½ per cent sinking fund gold bonds	1936	10,421,000	250	250	73.13	719.37	.....	.....
Two-year secured gold notes	1916	18,974,000	350	...	525.00	575.00	.....	.....
First mortgage extension 5 per cent gold bonds	1944	3,253,000	...	...	500.00	666.67	1.6667	.....
St. Louis Division first mortgage refunding 4 per cent gold bonds	2001	1,924,000	...	...	250.00	750.00	2.5	.....
KANSAS CITY & PACIFIC RAILROAD CO.:								
First mortgage 4 per cent bonds	1990	2,500,000	500	500	.....	.....	.....	36.67
MISSOURI, KANSAS & OKLAHOMA RAILROAD CO.:								
First mortgage 5 per cent gold bonds	1942	5,468,000	1,000	...	.....	.....	.....	33.33
MISSOURI, KANSAS & EASTERN RAILWAY CO.:								
First mortgage 5 per cent gold bonds	1942	4,000,000	750	...	537.50	.....	.....	.....
Second mortgage 5 per cent gold bonds	1942	58,000	...	...	500.00	656.25	1.5625	.....
MISSOURI, KANSAS & TEXAS RAILWAY CO. OF TEXAS:								
First mortgage 5 per cent gold bonds	1942	4,505,000	750	...	541.67	.....	.....	.....
DALLAS & WACO RAILWAY CO.:								
First mortgage 5 per cent gold bonds	1940	1,340,000	1,000	...	.....	.....	.....	33.33
WICHITA FALLS & NORTHWESTERN RAILWAY CO.:								
First mortgage 5 per cent gold bonds	1939	2,098,000	1,200	...	.....	.....	.....	.....
First lien collateral trust 5 per cent gold bonds	1925	838,000	500	...	675.00	.....	.....	.....
First and refunding mortgage 5 per cent gold bonds	1940	3,000,000	250	...	812.50	187.50	.....	.....
SOUTHWESTERN COAL & IMPROVEMENT CO.:								
First mortgage 6 per cent trust bonds	1929	743,000	500	...	890.00	.....	.....	.....
BOONVILLE RAILROAD BRIDGE CO.:								
First mortgage 4 per cent gold bonds	1951	897,000	...	1,000	.....	.....	.....	26.67

$14 in 10 year prior lien mortgage 6 per cent bonds, $6 in adjustment mortgage 5 per cent bonds, and one share of new common stock.

Holders of existing common stock, on payment of $25 a share, of which $10 is to be paid at time of depositing stock and the balance in three equal installments at intervals of not less than 30 days, are to receive per share $17.50 in 10 year prior lien 6 per cent bonds, $7.50 in adjustment mortgage 5 per cent bonds, and one share of new common stock.

It will be observed that the plan offers holders of the old

first 4s an increase in their coupon interest rate of one-half of one per cent, besides a 40-year maturity instead of the present 1990 maturity, which together give an additional income yield of over three-quarter per cent. Of this issue $39,999,500 are outstanding. Five issues aggregating $12,289,000 of existing bonds receive 100 per cent in fixed interest obligations of the new company. With these exceptions the principal of existing issues is largely scaled down in the new bonds bearing fixed interest.

Deposits of securities for the purpose of participating in the reorganization plan must be made with the various respective depositaries named in the plan on or before January 7, 1922. The reorganization managers in their absolute discretion may determine whether or when a sufficient amount of the securities of the various classes shall have been deposited to render it advisable to declare the plan operative.

Security Issues of New Company

The prior lien mortgage bonds will be limited to $250,000,000 at any one time outstanding. They may be issued in series with different maturities and rates of interest and with such redemption or conversion features as the directors may determine at time of issue. Bonds presently issuable under this mortgage for reorganization purposes are: Series A, 5 per cent 40-year, redeemable at 105 and interest, $52,942,752; Series B, 4 per cent 40-year, redeemable at par and interest, $27,236,000; Series C, 6 per cent 10-year, redeemable at 102½ and interest, $12,894,570. Additional bonds under this mortgage may be issued to the extent that the additions and betterments made on the system during Federal control may be funded or other settlement made with the Director General. The receiver states the amount of such additions and betterments is in the neighborhood of $8,000,000. Such additional bonds would presumably be of Series C.

The adjustment mortgage will authorize a total of $100,000,000 bonds outstanding at any one time. Within a limitation of 7 per cent these bonds may bear such interest rate and have such maturity as the directors shall determine at time of issue of any series, but the interest shall be payable prior to maturity only out of net income of the new company as defined in the accounting rules of the Interstate Commerce Commission, but to the extent of not less than 50 per cent of such income prior to January 1, 1925, and shall be cumulative from and after January 1, 1925.

Presently issuable under the adjustment mortgage are the following: In respect of existing securities dealt with under the plan for settlement of secured claims, or for other reorganization purposes, $51,973,756; to be offered to stockholders, $5,526,244. These bonds will be Series A, 5 per cent ranking for interest from January 1, 1922, maturing January 1, 1967, redeemable in whole or in part at par and accrued interest and convertible prior to January 1, 1932, into 7 per cent Series A preferred stock, par for par.

Preferred stock is authorized to the amount of $200,000,000, of which $24,500,000 is issuable for reorganization purposes as Series A bearing 7 per cent interest cumulative from and after January 1, 1928, and if allowed by law will be made redeemable in whole or in part at $110 a share.

Common stock is authorized to the amount of 2,500,000 shares without nominal or par value, of which 20,322 shares are issuable under the plan for exchange of securities or other reorganization purposes and 762,833 shares will be offered to stockholders under the plan.

Earnings and Condition of the Road

The announcement of the plan contains a reference to a letter to the reorganization managers in which the receiver, C. E. Schaff, calls attention to the fact that during the receivership capital expenditures on the property have amounted to $17,550,000 on roadway and structures, and $11,450,000 on new equipment and improvements to existing equipment, a total of $29,000,000. In addition, operating expenses have included maintenance charges amounting for the entire period to 41.03 of gross revenues, a ratio considerably higher than for the railroads as a whole, and undoubtedly including recovery of considerable arrears of maintenance from previous years.

Mr. Schaff goes into the nature of these improvements in some detail, and the changes in the condition of the track, revision of grades and alignment and locomotive power are all reflected in the following comparisons of operating efficiency:

	1920	1915	Inc.	Per cent
Average tons per locomotive.....	498	353	145	41.19
Average tons per loaded freight car.	24.35	20.11	4.24	21.08
Average tons per train inc. co. freight.	504	364	140	38.46

The announcement of the plan gives also further details of the property as follows:

"The present excellent condition of the system, and the efficiency with which it is being operated is also shown by comparing its transportation ratio with that of other South Western Lines, such as the St. Louis-San Francisco, Missouri Pacific and the Rock Island. The comparative figures are:

	Three Months Ended September 30, 1921	Six Months Ended September 30, 1921	Twelve Months October, 1920 to September, 1921
M. K. & T. Lines.....	30.65	34.29	37.13
Frisco Lines	35.03	38.44	40.08
Missouri Pacific	36.25	38.87	41.47
Rock Island Lines.....	36.42	39.37	42.60

"Furthermore it should be noted that the transportation ratio (items resulting from federal operation excluded) for the Katy System for the twelve months ended September 30, 1921, as compared with the twelve months ended September, 1917, only shows an increase of 6.9 per cent, whereas the percentage of increase in the transportation ratios for the same period for the Rock Island Lines is 17.07 per cent; for the Frisco 21.97 per cent, and the Missouri Pacific 29.11 per cent.

"For the fiscal year 1915 the road's gross revenues were $32,453,462, from which figure they have increased every year until for 1920 (calendar year) they stood at $72,914,737, an increase in five and a half years of $40,461,275, or 125 per cent. Much of this gain, of course, is due to higher rates, but the average density of freight traffic has also increased every year from 573,398 ton-miles per mile of road in 1915 to 873,342 in 1920, a gain of 52 per cent.

"Since the resumption of full private operation the road has shown an operating ratio of 80.19 per cent for the year ended August 31, 1921. In the same period the road earned, after deduction of expenses, taxes and rentals, a balance applicable to bond interest of $9,715,009. This compares with the proposed fixed interest requirements of the new company, as stated above, of $4,917,717, and with all interest charges, including that on the adjustment mortgage bonds, payable, if earned, of $7,792,717."

Further details concerning the present status of the Missouri, Kansas & Texas were published in an article by Samuel O. Dunn, editor of the *Railway Age*, entitled "Progress of Missouri, Kansas & Texas Since 1913," which article appeared in two parts in the *Railway Age* of June 10, 1921, page 1321, and June 17, 1921, page 1385.

IN PART the present volume of business reflects merely seasonal production and trade, but when allowance is made for this condition it appears that substantial progress is being made toward normal business activity, which should be realized if the foreign and domestic clouds on the horizon are cleared.—*Guaranty Survey.*

A 2½-ton Truck and 4-ton Trailer

A Formula Covering Costs of Heavy Motor Trucking

Shows the Superiority of a Time Basis Over Ton-Miles or Truck-Miles for Computing Expenses

By Colonel Charles Hine

Late Motor Transport Corps, American Expeditionary Forces, France

A MOTOR TRUCK with a cargo capacity of five tons costs about $5,000 and has a life of about five years. Its expectancy of productive work cannot ordinarily exceed five days a week or 260 days per year, the other days being idle time due to Sundays, holidays, shop work, painting and business shutdowns.

Good business procedure demands the setting up of an amortization account for every capital expenditure. A $5,000 truck should be amortized on the basis of $4,600 as the tires, costing about $400, are expendible and, therefore, chargeable to operation. Depreciation over five years means $920 per year and the interest charge at 8 per cent is, for each of the five years in succession, $368, $294.40, $220.80, $147.20, $73.60; total interest, $1,104; total principal and interest, $5,704. For the convenience of a uniform amortization charge it is sufficiently accurate to divide this last total by five years and then by 260 working days which gives $4.38 as a safe charge for amortization for each working day.

The wise purchaser of a truck will, at once, insure it against theft, fire, accident and liability for damage done to others. Because of heavy claims paid by insurance companies this item is increasing rather than decreasing and may be put at $416 per year or $1.60 per working day.

Another charge that begins to run with ownership is that for taxes, including license or registration. This item is also on the increase owing to a public demand that motor trucks contribute a larger share of the cost of highway maintenance. This may be estimated at $520 per year or $2.00 per working day.

A garage of some kind, public or private, is essential and, including the washing and inspection of a truck, costs about $30.00 per month, $360 per year, or $1.38 per working day.

Assuming the owner to have only one truck and to be his own driver a headquarters' office with telephone service, through which orders may be placed and from which business may be solicited, is necessary. For the owner of one truck this may be arranged with some office existing for other purposes by paying the proprietor, or a clerk, to act as truck representative which, including the use of the telephone, will cost about $45 per month, $540 per year, or $2.07 per working day. As the owner expands his business and increases the number of his trucks he will, sooner or later, need an office of his own with expense for rent, light, heat, telephone, furniture, stationery and clerk hire. The continued allocation of $2.07 per working day per truck should be sufficient for this item.

The owner should allow himself driver's wages which, with overtime, will run about $35 per week or $7.00 per working day. A helper, or his equivalent in loaders and unloaders, is needed and will cost $25 per week or $5.00 per working day.

The wise owner-driver, on buying his second truck, will cease driving and become a supervisor. As a supervisor he should continue to receive driver's wages and as owner he should also receive owner's profit. This means that each of the two trucks should be charged with a supervision cost equal to one half of driver's wages or $3.50 per working day. As the trucks expand in number to a fleet more supervisors become necessary as do runabout cars for use in supervision. A continued charge of $3.50 per truck per working day should cover supervision.

Constant Elements of Cost May Be Equated in Miles or Mile-Hours

All of the foregoing elements of cost are designated herein as constant elements because they are assumed as functions of

time and as being independent of miles run or tons hauled.

Amortization is allocated by time units rather than by distance units because of the wide variations in commercial mileage and of the still rapid development of a young art. A new truck, well housed and cared for, left standing idle for five years might be nearly as good as new and yet be much depreciated in value because of better trucks then on the market.

Insurance, taxes and garage are manifestly functions of time.

The elements of office, driver, helper, and supervision are allocated by time in the belief that no enterprise can long prosper where skilled and faithful men are ruthlessly laid off whenever business slows down. Society, for its own protection, is demanding that industry be so organized and profits be so adjusted as to insure continuity of employment to a normal number of tried and qualified employees.

These constant elements may, for convenience, in comparison, be equated in miles or mile-hours where warranted by sufficiently constant and uniform mileage performance.

Variable Elements of Cost May Be Equated in Days or Hours

The five remaining elements of operating cost—cargo insurance, fuel, lubrication, tires, and repairs—are designated herein as variable elements because they are assumed as functions of cargo and distance.

Cargo insurance, because of large claims paid by insurance companies, is increasing in rate. In some cases the rate is said to be nearly prohibitive. This element is the most difficult to estimate and is assumed at $4.57 per working day.

Fuel consumption varies with highway, trucks, cargoes, repairs and drivers. It runs from 4 mi. to 7 mi. per gal. of gasolene at a cost of from 4 cents to 7 cents per mi., 6 cents per mi. being a safe normal.

Lubrication requires a gallon of oil costing about 80 cents for every 150 mi., which with some special lubricants gives a normal cost of something like ½ cent a mile.

Tires cost from $400 to $600 a set with varying guarantees by manufacturers as to mileage. Five cents a mile may be assumed as a safe normal.

Repairs, including a periodic overhaul, are found by experience to be about 2 cents a mile. In congested city districts, with many sharp turns and much stopping and starting, it may be found that repair cost increases relatively faster than mileage and varies with time rather than distance.

These five variable elements may, for convenience in comparison, be equated in days or hours where warranted by sufficiently constant and uniform time performance.

Intraurban trucks often make only 20 mi. or less per working day and often handle only 20 tons of cargo. Interurban and suburban trucks seldom exceed 100 mi. per day.

A trip of about 50 mi. and return, or a total of 100 mi., is normally the limit which can be undertaken and permit return to the home garage the same working day. Longer trips usually necessitate an allowance for garage en route and for meals, if not also lodging, for driver and helper. Traffic is seldom balanced in direction. A 5-ton truck is lucky to handle 8 tons in a trip of 50 mi. and return.

From these practical assumptions there is derived the table designated herein as a typical formula. It is intended as a rough guide in estimating costs of heavy trucking. Based on high, rather than on low, figures of cost it is offered as a safe maximum. Application in a given case with known and actual values substituted for the assumed values will perhaps show the total cost as 10 per cent to 25 per cent lower than the total of the typical formula.

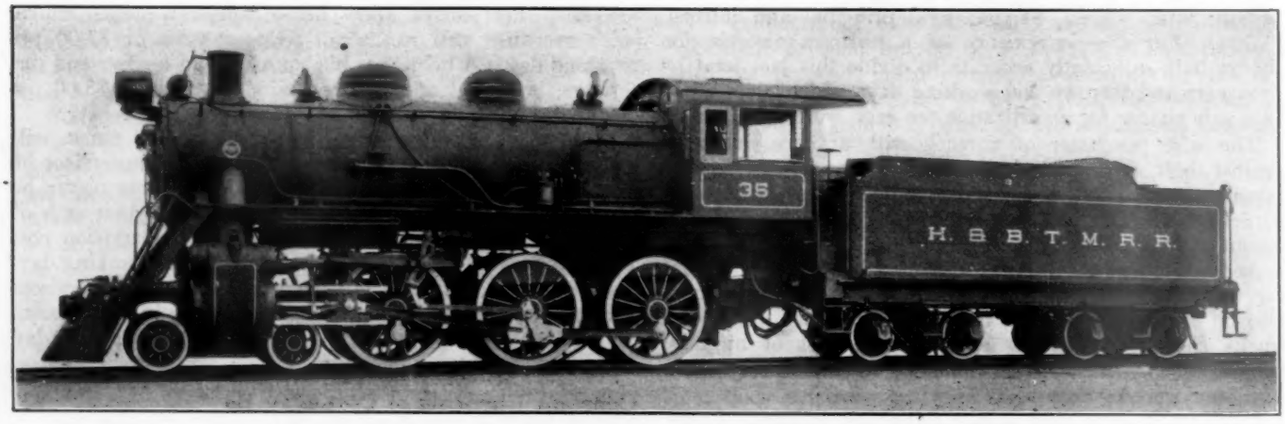
TYPICAL FORMULA COVERING COSTS OF HEAVY MOTOR TRUCKING

Conditions: $5,000 *Truck*, 5 *Tons*, 5 *Years*, 5-*Day Week*, 260 *Working-Day Year*, 9-*Hour Day*

	Dollars per working day (9 hours)	Cents per truck mile, 100 mi.-day (8 tons)	Cents per truck mile, 20 mi.-day (20 tons)
Amortization	4.38	4.38	21.90
Insurance	1.60	1.60	8.
Taxes	2.	2.	10.
Garage	1.38	1.38	6.90
Office	2.07	2.07	10.35
Driver	7.	7.	35.
Helper	5.	5.	25.
Supervision	3.50	3.50	17.50
Cargo insurance	4.57	4.57	22.85
Fuel	6.	6.	6.
Lubrication	0.50	0.50	0.50
Tires	5.	5.	5.
Repairs	2.	2.	2.
Total	45.	45.	171.
Per hour	5.	....	....
Per ton-mile	....	11.25	34.20

It is apparent that it is better for a truckman to base his costs on days than on miles. Neither the ton-mile nor the truck-mile is a safe unit for a truckman. As compared with a railway his tons and his miles are relatively too few to absorb the wide fluctuations in individual cargoes and hauls.

It is further apparent that any device like a demountable body or other form of unit container which reduces the standing time of truck must increase tonnage handled per truck per day, and therefore reduce the cost per ton.



Ten-Wheel Passenger Locomotive for Huntingdon & Broad Top Mountain

Two of these locomotives have lately been delivered by the Baldwin Locomotive Works. They are designed to make a 52-mile run on a road with 18-deg. curves and 1.86 per cent grades in two hours, making 20 intermediate stops. The locomotives weigh 175,000 lb., of which 132,000 lb. are on the drivers, have a tractive effort of 28,000 lb., cylinders 21 in. by 26 in., 66 in. drivers, boiler pressure 190 lb., evaporative heating surface 1,987 sq. ft., superheating surface 489 sq. ft. and grate area 42.5 sq. ft.

Henry Ford Is Right—and Wrong*

Principal Change Made on D., T. & I. Is Increase in Earnings Derived from Motor Traffic

By Walker D. Hines
Former Director General of Railroads

HENRY FORD'S attitude on railroad problems, as set forth in the November Nation's Business, appeals strongly to the American people. His face is turned towards the future, and he confidently proposes reforms which are in the public interest. But the beguiling charm of his genius makes it all the more important to weigh with care his criticisms and proposals.

At present we have the results of only six months of Mr. Ford's management of the D., T. & I., the months of March to August of the present year. It is impossible to formulate with certainty conclusions of controlling value from the six months' operation of any railroad, but as to Mr. Ford's railroad, the one thing about which we can be certain is that his small railroad has become an adjunct to his big motor plants, and that this has completely changed the railroad's earning capacity and has put it in a class entirely apart from railroads in general in this country.

What Ford Ownership Meant

A favorable earning capacity for a railroad depends, of course, on its costs, but even before that it depends on an adequate volume of business that pays a satisfactory revenue and admits of being handled under favorable operating conditions. It is in these respects that Mr. Ford has wrought the one certain metamorphosis in the character of the D., T. & I., and he has done it simply because he has turned over to it the great and steady traffic to and from his factories. In addition to a large inbound movement, his plants give the D., T. & I. probably more than 5,000 cars of high-class outbound traffic per month—a traffic that earns an unusually good revenue and that has the rare advantage of being received, handled and delivered, in solid trainload lots, so as to minimize the heavy costs of terminal handling and so as to get the maximum service out of the train—and all this over the northern part of the railroad, which is understood to have the best operating conditions.

Mr. Ford denies that this change is important, because he says the railroad had an even greater tonnage in the past. But he strangely overlooks the fact that the tonnage in the past earned a much smaller rate and could not be handled from origin to destination on the Detroit, Toledo and Ironton in solid trainload lots.

In the past the traffic of the D., T. & I. has appeared to be peculiarly lacking in all good points, but overnight it finds itself blessed with a large additional traffic of extraordinary desirability which more than offsets the diminution in tonnage which the D., T. & I. has suffered during the present long and serious slump in business.

By purchasing this railroad Mr. Ford has done what was the equivalent of bringing practically every competing railroad system in the country to the door of his factory, and that is an advantage which no competing manufacturing plant enjoys. What he can do through this means in getting for his railroad increased divisions of through rates remains yet to be ascertained, because it is not at present known, but the impression prevails that he has secured increased divisions. A shipper who does not own a railroad must pay the published tariff rate which is known to his competitors, and he cannot lawfully get any concession from the carriers. But when he owns his own railroad he can get in the shape of an increase in the division received by his railroad out of the through rate a concession which is not published in the tariffs or reported, unless in exceptional cases, to the Interstate Commerce Commission. Certainly there is a tremendous inducement for especially large divisions when the shipper can offer to a large number of competing railroads the tempting bait of high-class traffic in trainload lots.

There are probably other advantages for his railroad growing out of his position as a shipper. For example, it would be strange if Mr. Ford could not force his connections to take his desirable traffic at such hours in the day or night as to save his railroad (and as to put on the connecting railroad) the succeeding day's rental or per diem of $1 per day per freight car. Likewise he is apparently able to force his connection to supply special service by accepting traffic from his road within a few minutes after they receive it.

The fact that under such circumstances the railroad has turned long-standing adversity into a certain measure of prosperity is the most natural thing in the world, and in itself proves nothing whatever for the Ford railroad policies, which are too new to admit of measuring their economic value—and indeed some of the most important and interesting of these policies did not become effective until the very end of the six-months period and even now some of them are still entirely in the realm of discussion.

Mr. Ford states that he has speeded up the movement of traffic on his railroad and that other railroads should do likewise. This brings into interesting relief the fundamental difference between the railroads in general and the D., T & I. in its new role of Ford plant facility.

The great element in the slow movement of freight traffic is the time consumed in the terminals. It is highly important to reduce terminal work and to cut out delay in the terminals. The United States Railroad Administration gave special attention to this subject and found the most cordial attitude on the part of railroad officers generally to its efforts in this direction. It inaugurated in September, 1919, special local terminal committees, with representation of the shippers as well as of the railroads, and sought to put into effect all practical suggestions looking to the elimination of factors leading to delay or unnecessary work. Similar efforts have been continued since the resumption of private control.

Better Ideas Welcome

Every additional impetus of improvement is to be welcomed, whether through consolidation of terminals or terminal handling, movement of trains without breaking them up at intermediate terminals, increased promptness in effecting deliveries between connecting railroads, elimination of delays as, for example, delays in loading or unloading, or on account of billing or because of slowness in repairing cars developing defects in transit. Any new thoughts which Mr. Ford can originate and justify will be gladly seized upon by the railroad fraternity, in my opinion. But apparently the principal way in which he copes with the terminal problem is to put the terminal burdens on his connections by requiring them to take the traffic off his tracks within 20 minutes. What happens after that is not his problem, but theirs. They are no doubt willing to do this as a special

*Abstract of article in Nation's Business for November, 1921.

service in his particular case in order to get his traffic (and to maintain, if necessary, special terminal crews for this purpose), but it does not follow that they can do the same thing in all cases.

Mr. Ford also says that he has been able to speed up the delivery of the traffic from his factories by from 7 to 14 days. He says this enables him to reduce his working capital by about $30,000,000.

It is clear he does not mean that he has reduced the time of movement over his own railroad by from 7 to 14 days. In fact, this traffic does not move on his own railroad except for a short distance in most cases—say from 70 to 100 miles. What he must mean is that he demands of his connections as the price of giving them his traffic that they speed up the delivery to final destination. Here again his connections may be willing to do this in order to get his traffic, but it does not follow that they can do the same thing for all of Mr. Ford's competitors or for the general public, and the question again arises whether the railroads may not at times be forced to delay other traffic in order to give Mr. Ford the special fast movement which he demands and which his special position enables him to obtain. It is clear that Mr. Ford's railroad does not supply the ideal field for experiment as to fast train movement, because the haul on his railroad is too short and his traffic is too special in character to present the problems which exist on the railroads generally.

Where Did the Speeding Up Occur?

If we were to judge by the average car miles per day, we would have some question as to whether he has made sustained progress in speeding up the handling of the traffic over his own line. These averages for the last six months, March to August of this year and last year, were as follows:

Month	1920	1921	Month	1920	1921
March	20.5	27.8	June	10.9	25.1
April	9.6	26.3	July	18.5	21.6
May	10.7	27.3	August	26.9	20.7

It is fair to say, however, that this average of car miles per car per day is by no means conclusive of the speed obtained in the movement of cars actually handling traffic, because the average is based on all the cars which happen to be on the railroad at the time, including surplus cars. Thus in the time of a slump in business such an average goes down, and in time of heavy business the average goes up, regardless of the actual speed of the cars containing loads.

However, despite the unique situation of the D., T. & I. at the present time, it is to be confidently expected that Mr. Ford will make numerous improvements in operation which can be followed to advantage on the railroads generally. The promotion of contentment, and consequently of increased efficiency on the part of the employees, the elimination of unnecessary employees (including lawyers), the resort to more direct action and the cutting out of lost motion in the settlement of claims, the getting rid of obsolete or needless reports and statistics, the development of the standing and authority of the local station agents, are all things which are pre-eminently desirable, and it is to be earnestly hoped that Mr. Ford can throw new light on how to accomplish them.

It must be again emphasized that it is yet too early to know what economies Mr. Ford can achieve even with all those advantages which put his railroad in a class entirely apart from the railroads in general. The results of operation for the six months, March to August, 1921, do not indicate a steady upward trend in his net. The figures are as follows:

	Operating revenue	Operating expenses	Operating income
March	$439,052	$352,970	$76,252
April	697,491	395,816	291,905
May	744,406	422,328	311,302
June	713,527	376,383	327,003
July	744,498	444,794	285,329
August	763,840	548,246	197,234

These figures, in connection with those above given for the months of March to July, emphasize anew that the principal factor in the net is the greatly increased gross, notwithstanding a smaller tonnage.

The country will certainly be the gainer if Mr. Ford can design lighter locomotives which will do the same work as the existing heavy locomotives, and if he can design lighter freight cars which will do the same work as the existing freight cars and which will be strong enough to be hauled and switched (as they would have to be) in the same trains and cuts of cars with the existing heavy equipment throughout the country, on all sorts of grades and curves and under all sorts of conditions.

It is not clear what Mr. Ford means by eliminating the unproductive stockholder. I cannot imagine he means that existing stock should be confiscated. If he means that for the future stock should not be issued except for appropriate value which has been or is to be put into the property, that seems to be assured by the Transportation Act. If he means that it is desirable to encourage the ownership of stock by employees and by people who live in the communities through which the railroads run, that certainly is an ideal which I believe the public and railroad people would like to see realized. The closer we can get to a condition where the people who use and work on the railroads themselves own the railroads and help to finance them, the better it will be for the country. If Mr. Ford can develop some new methods of accomplishing this result, he will certainly render an important service by doing so. It is seriously questionable, however, whether this movement ought to be carried to the extent of promoting the control of common carriers by large industrial enterprises.

While speaking of the promotion of the ownership of railroad stock and the financing of railroad necessities by the railroad employees and the people living in the communities along the railroads, I would like to suggest that in order to accomplish such an object it is most important that the government avoid making frequent and hasty changes in its railroad policy.

"Contrary to the Public Interest"

For example, it would be a detrimental move if the government in this difficult and transitional period should repeal the authority the Interstate Commerce Commission possesses for the protection of the interstate situation over intrastate rates, or should repeal the duty of the commission to fix rates sufficient, within practicable limits, to pay a fair return on railroad property. Through such repeals the chance of securing more widespread popular ownership of railroad securities and greater participation by the general public in railroad financing would be rendered much more remote, and the necessity for restoring at high cost to highly specialized financial experts for assistance in railroad financing would become greater than ever.

In conclusion I wish to express my personal opinion that it is contrary to the public interest for a large shipper like Mr. Ford to own and operate a railroad by means of which he has a powerful leverage for obtaining special consideration from the common carriers of the country. But as long as this is permitted by law, we can at least congratulate ourselves that the present combination is in the hands of a genius who is willing to turn his railroad into a laboratory for the making of the experiments and I shall be surprised if some of the experiments do not turn out to be valuable from the standpoint of railroad companies in general.

Surely with his remarkable record in economical production and with his extraordinary personality he can impress his spirit and his methods upon 450 miles of railroad with about 2,000 employees so as to obtain substantial economies. Some of them should be practical examples for the 250,000 miles of railroad with their 2,000,000 employees, but their problems are by no means as simple and they cannot enjoy the unique advantages which the Ford railroad enjoys.

Novel Engine Facilities for a Cold Climate

Canadian National Builds Rectangular Enginehouse with Radial Tracks and Enclosed Turntable

FAR UP IN THE North country at Hoornepayne, Cnt., Can., where the winters are long and rigorous, the snowfall heavy and a temperature often as low as 60 degrees below zero, the Canadian National Railways has constructed an engine-house of unique design. Rectangular in shape, of brick and concrete construction with ample facilities for heat, light and ventilation, it encloses an 80-foot turnable, thus completely protected from snow and ice, 16 radial engine stalls, a machine shop, a boiler room and other miscellaneous store and office facilities.

The new structure replaces an old 10-stall timber roundhouse and forms the major part of a small yard and terminal project. The old building, as well as its supplementary facilities such as the machine shop, drop pits and other accommodations were all lacking in modern improvements and had grown inadequate. The need for more extended facilities to handle efficiently the larger power necessary on this division had become more and more acute but the immediate necessity for a change did not arise until the old roundhouse was destroyed by fire.

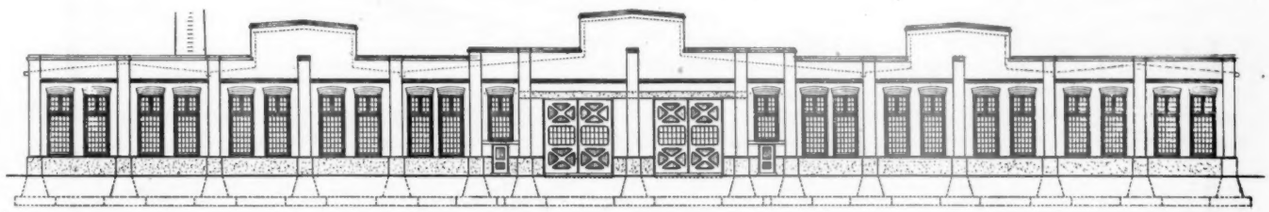
New Terminal Layout of Much Larger Capacity

The present arrangements have been built of much greater capacity to meet both the present and possible future requirements at this point. Hornepayne is located on the main transcontinental line of the Canadian Northern division of the Canadian National, about 290 miles east of Port Arthur on Lake Superior. The operating divisions in this territory, are, as it might be expected, of good length, extending on the east to Foleyet and on the west to Jellicoe, distances of 148 miles and 150 miles, respectively.

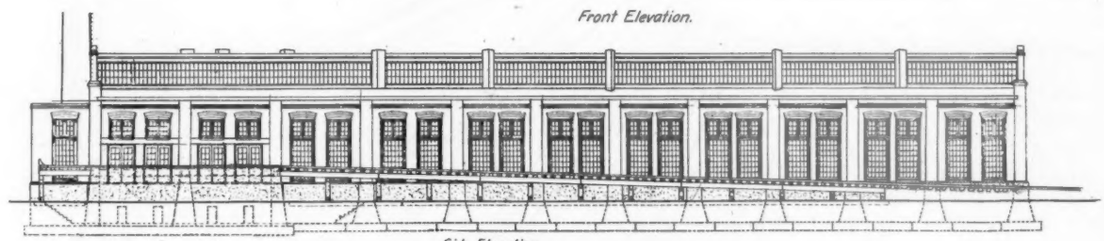
As a consequence of the fire and the need for more modern and adequate facilities, the entire terminal layout was rearranged to conform with the increased capacity of the enginehouse. This entailed the construction of eight new supporting yard tracks, in-going and out-going engine tracks, sidings and emergency roundhouse tracks, etc., totaling about 17,700 feet. About 7,800 feet of old trackage was removed. Other facilities included in the modernization of the Hornepayne engine terminal were a well-equipped coaling plant, an ash and cinder handling plant serving two tracks, a heated water tank, an ice house and a store house. On the main line adjacent to the engine terminal there has been constructed a new two-story passenger station and platform and a 30-foot by 100-foot freight station. The passenger station is of brick and concrete construction and contains all arrangements necessary for the care of passengers, including a restaurant. The second floor has a full complement of offices for the division officers and their forces.

Large Size Provides Ample Space for All Facilities

In constructing the new enginehouse, the old 80-foot turntable was utilized and the new structure built around it. Rectangular in shape, as stated, the long side of the building has been placed at right angles to the general center line of the enginehouse tracks. It is 287 feet 7½ inches long and 223 feet 3 inches deep, supported on concrete foundations carried down 7 feet below the grade line, a depth necessary because of frost, and from the grade line up to the height of the window sills. The remainder of the walls is of brick pier construction with pilasters spaced 18 feet 10 inches and 21 feet 6 inches center to center, depending upon their location. The area covered by the enginehouse is approximately 1½ acres, the roofing over of which has been accomplished by the use of 19 steel columns carrying steel trusses and purlins. Three monitors run from front to rear with steel sash windows on each side. The roofing itself is 2¾ inches, splined roofing covered with tar felt and gravel. The columns surrounding the turntable are spaced 56 feet 6 inches from each other and 43 feet from those adjacent. The maximum span is thus over the turntable, or a distance of 113 feet. The columns are all supported on concrete pedestals carried down 7 feet below the grade line with bases of large dimensions, varying up to as high as 13 feet square.



Front Elevation.

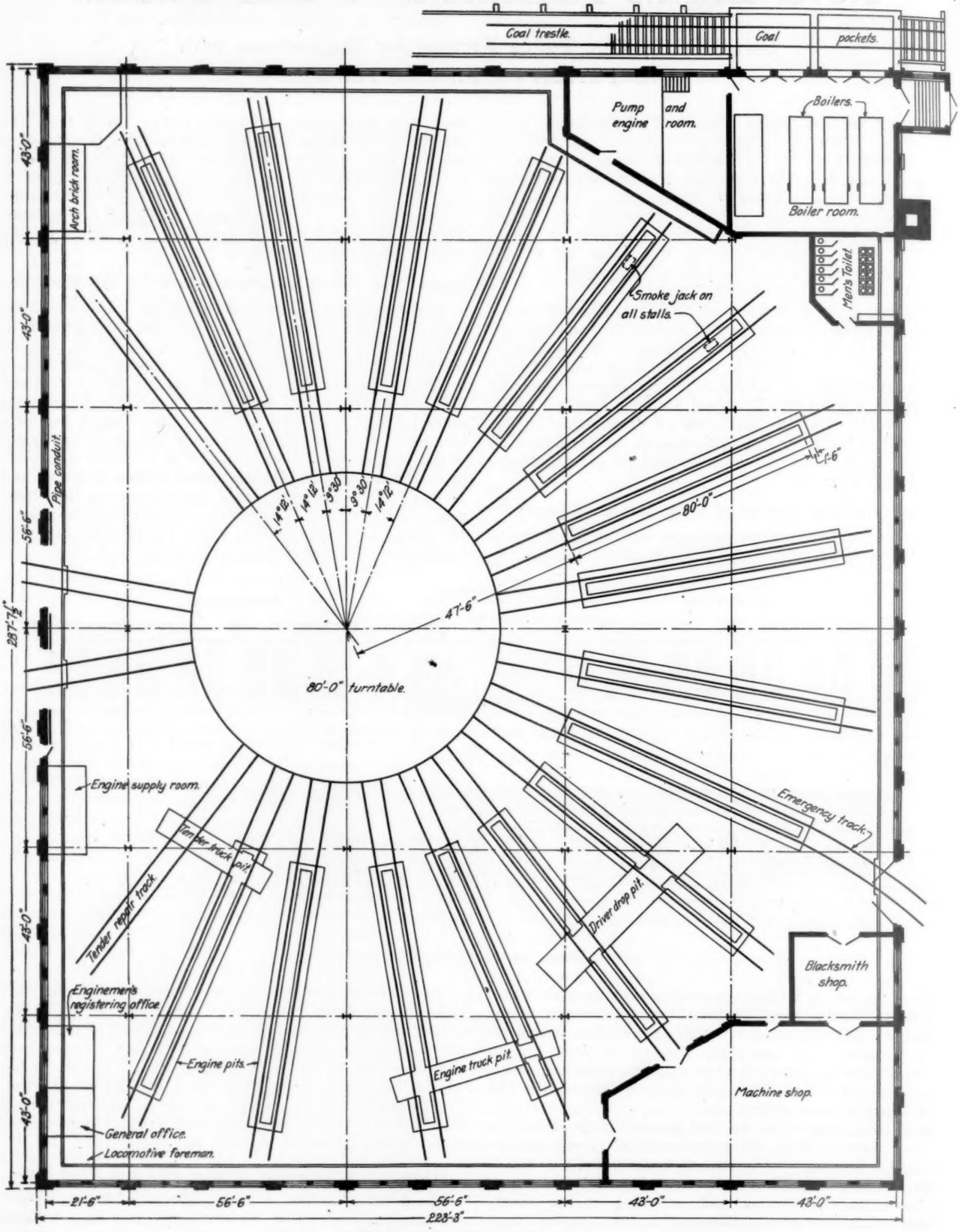


Side Elevation.

Two Views of the Rectangular House

Modern Installation of Engine Pits and Drop Pits

The turntable serves 16 tracks, of which 14 are provided with concrete engine pits, 80 feet long. The angle between track centers is 14 deg. 12 min. except where the roof columns are located around the turntable. At such points the angle has been increased to 9 deg. 30 min. from the line passing through the column and the turntable center, or a total of 19



Floor Plan of the Enginehouse

degrees between adjoining track centers. The distance from the center of the turntable to the line of the smoke jacks is 119 feet 6 inches. A full complement of modern wheel pits has been provided, the construction including a driver drop pit, an engine truck pit and a tender truck pit.

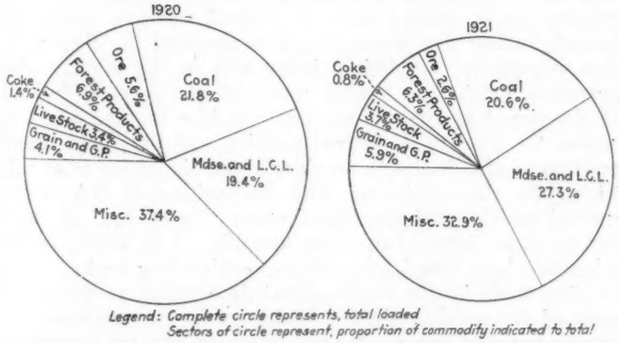
The two rear corners of the building have been utilized for the boiler and engine room layout and the machine shop and blacksmith shop. In the former case a room 42 feet 11 inches by 40 feet houses three locomotive-type boilers and a washout plant. Coal is supplied by a hopper track and trestle at the rear which discharges into a large concrete hopper directly adjacent to the boiler room. The pump or engine room adjoining this contains the water pumps, air compressors and electric generator for lighting current. The other corner contains an irregularly-shaped machine shop fully equipped with the latest type machinery necessary for making running repairs. Its maximum dimensions are approximately 74 feet by 40 feet. Other facilities include a locomotive foreman's office, an engineer's registering office, a general office, a locomotive supply room, an arch brick room, tool rooms and a modern lavatory and wash room, all within the walls of the building.

Ample ventilation and light are provided by the sash windows in the three monitors and by the numerous large windows in the side walls. The generator mentioned furnishes current for electric lights. Heating is provided by steam coils on the side walls and in the engine pits.

The Hornepayne enginehouse and terminal layout were constructed by the Canadian National's own forces, the design and construction being carried out under the supervision of George C. Briggs, then architect of the eastern lines and now architect of the western lines, to whom we are indebted for the information contained in this article.

Freight Car Loading

THE NUMBER of cars loaded with revenue freight during the week ended November 12 shows another large drop, according to the weekly report of the Car Service Division of the American Railway Association, due largely to the effect of the Armistice Day holiday and election day in several states. The total was 753,046, as compared with 829,722 the week before, 927,586 in the corresponding week of 1920 and 808,304 in 1919. There were decreases as compared with the preceding week in the loading of all classes of commodities except livestock, which increased from 31,126 to 34,269. There was also a large increase in the freight car surplus during the period from November 8 to 15 to 140,189, as compared with about 93,000 the week before. Of the total surplus 51,527 were box cars and 56,086 were coal cars.



Revenue Freight Loaded, Cumulative—January 1 to November 5

Sprague Train Control to be Tested On New York Central

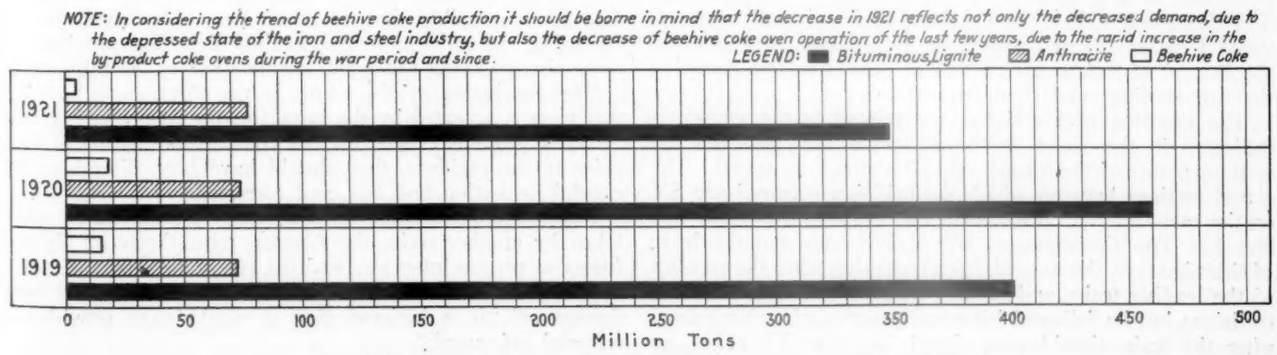
A CONTRACT HAS this week been signed between the New York Central Railroad Company and the Sprague Safety Control and Signal Corporation for an intensive test of the latter's system of auxiliary train control on a section of main-line southbound express track No. 2 between Ossining and Tarrytown on the electric division.

This contract is the result of negotiations initiated last February by the Joint Committee on Automatic Train Control of the Bureau of Safety of the Interstate Commerce Commission and the American Railway Association, at which time President A. H. Smith, in response to a suggestion by the Joint Committee consented to a test of the system under suitable conditions provided details could be arranged to mutual satisfaction.

This proposal came at a time when the late Public Service Commission (Second District) of New York, had under consideration a proposal to inaugurate tests of a somewhat different character, and was the result of a decision by the joint committee, acting in view of the new conditions created by the mandatory power given to the Interstate Commerce Commission in the Transportation Act, 1920, to test a limited number of devices or systems.

Following the affirmative response of President Smith, the engineering representatives of the Interstate Commerce Commission, the American Railway Association, the New York Central and the Sprague Corporation held a number of meetings to determine the location, extent and character of the tests; and from the locations considered that on the main track between Signal 3002 at Ossining ("PF") and Signal 2652 at Tarrytown ("OW") 3½ miles, was selected for the installation of track apparatus.

The test determined upon is exceptional, in that instead of a number of equipments being mixed in with the regular traffic and normally subjected to only occasional operation, the experimenters will have a section of track all to themselves. A large number of tests covering every variety of operating conditions will be carried out, practically continuously, for several months, on a reserved section of main track where the highest speed is permissible, and where the equip-


NOTE: In considering the trend of beehive coke production it should be borne in mind that the decrease in 1921 reflects not only the decreased demand, due to the depressed state of the iron and steel industry, but also the decrease of beehive coke oven operation of the last few years, due to the rapid increase in the by-product coke ovens during the war period and since.
LEGEND: Bituminous, Lignite Anthracite Beehive Coke
1921
1920
1919
0
50
100
150
200
250
300
350
400
450
500
Million Tons

Cumulative Production of Coal—Tons, January 1, to November 5

ment can be subjected to a combination of adverse conditions.

While the details of the equipment have not been made public, it is understood that the system, which is of the intermittent magnetic impulse type, embraces in its track elements a series of brake application and differential brake determining magnets fixed in each block well below the heads of the running rails. From these magnets, under the control of the signals and hence of the traffic conditions, momentary magnetic impulses are transmitted to sensitive receivers on the locomotive to initiate primary and secondary brakings. The braking can be either service or emergency, and of varying degrees; under speed control, and with or without enforced stops.

The location selected and the methods prescribed for the tests will afford a critical test of the possibilities of automatic train control. Being in the electric division the running rails are used for power as well as for signal currents, and the track elements will be subject to whatever possible interference there may be, not alone from the direct current flowing in the running and third rails, but from any alternating currents used in the signal installation.

Over these tracks will operate not only the steam locomotive under test but likewise heavy electric locomotives and multiple unit electric trains, thus subjecting the track magnets to a variety of extraneous influences. Upon the present normal-clear alternating-current automatic block signal system will be superimposed a direct current "normal danger" track magnet system, the current for which will be derived from the alternating current transmission circuits.

The track on which the tests are to be conducted will normally be kept entirely free from all other traffic for eight hours a day, from 9 a. m. to 5 p. m., for not less than five days a week, during which time all traffic will be handled on the remaining tracks, this arrangement being, of course, subject to emergency traffic conditions. The setting aside of a section of main line track on a railroad of the first class, in its busiest zone, for several hours a day and for several months, and the tuning up of this track so that speeds as high as 70 miles an hour can be made during the tests, was so radical a departure that the contract was only finally concluded after it had been passed upon by the board of directors of the railroad company; an augury of the serious character of the tests to be undertaken. Preparations for the test have been under way for some time, and it is expected that operations can be begun early in January.

Report on Gould (Ohio) Collision

IN A REAR COLLISION of westbound trains on the Pennsylvania Railroad in tunnel No. 5, at Gould, Ohio, seven miles west of Steubenville, on September 25, one engineman and one conductor were killed; six mail clerks and three trainmen were injured, and the road was blocked 28 hours. This collision was due to a false indication of a semi-automatic block signal, this false indication having been due to a ground in one of the wires controlling it. The Interstate Commerce Commission has issued a report, dated October 19, and signed by W. P. Borland, Chief of the Bureau of Safety, giving this as the cause, and detailing the surroundings and the circumstances.

The situation of the signals, as related to the tunnel, is indicated in the sketch below, in which WP indicates the western portal of the tunnel and EP the eastern portal. The signal stations between which the collision occurred are SX on the east and NA on the west, and the signal at fault was No. 13. The signalman at NA should have put the lever of this signal in the normal (stop) position after the passing of the leading train, and thereby he would have averted the collision; but he followed his usual practice of waiting until after the train should pass signal 16 (near his cabin, as indicated in the sketch) before restoring the lever to the normal position.

NA 16 WP EP 13 SX

The tunnel is 3,320 ft. long and its eastern end is a half mile west of Gould station. Signal cabin NA is 1,350 ft. west of the western portal of the tunnel, and signal 13 is 2,275 ft. east of the eastern portal.

The leading train was a freight, extra 7468, consisting of locomotive, 32 cars and caboose. It passed SX at 11:01 a. m. and was moving, in the tunnel, at about seven miles an hour when it was struck, the grade in the tunnel being ascending at about 75 per cent.

The following train was No. 11, consisting of seven mail cars and one combination car (no passengers) hauled by two locomotives. It passed SX at 11:07 a. m., six minutes late, and collided with the freight at about 30 miles an hour, wrecking the caboose and seven cars of the freight train. The ventilating fan of the tunnel was not in operation, the power having been cut off to allow linemen to work on the wires, and there was considerable smoke in the tunnel. The marker lights on the caboose of the freight were not burning; but it is stated that probably they would have been invisible.

The testimony concerning the position of the arm of signal 13 would indicate that the abnormal condition was intermittent; but there is no doubt that it was in the 45-degree position for train No. 11, giving that train right to proceed expecting to be stopped at signal No. 16.

The report contains a diagram showing the signal circuits as far east as Mingo Junction. The false closing of the relay controlling signal 13 was dependent in part on the position of circuit closers on signals and signal levers at SX, which is more than two miles east of signal 13. As the circuit breakers changed position according to whether the signal (or the lever) was in the normal position or otherwise, the effect on signal 13 was intermittent.

About six minutes ahead of the freight train, westbound train No. 1219 had passed, and the operator at NA noticed that the repeater in his cabin moved from horizontal to clear while the train was in the tunnel. This had happened before, so he supposed that the instrument was out of order and sent for a repairman. On the approach of freight 7468 the repeater again seemed to be in normal working condition; but after about five minutes it again assumed the clear position wrongfully, the freight being still in the tunnel. The operator thought the trouble was with the repeater instead of the signal and it did not occur to him that he ought to restore the lever to its normal position and thus hold signal position of circuit closers on signals and signal levers at SX, 13 in the stop position. The interlocking at NA is inspected weekly, and the relays, electric locks, etc., are subject to an additional inspection monthly. The wiring at the cabin had been tested for resistance within two weeks.

Tests made by the road's signal department on the afternoon of the accident showed faulty conditions (grounds) in electric wires at five places, one of which was not located.

There was a severe electric storm at about 2 a. m. on the date of the accident and the assistant supervisor of signals thought it possible that some of the faults were due to lightning, the only protection against lightning provided in these circuits being pin-point arresters across the relay coils.

The conclusion of the report is not clear as to how far this view is accepted by the inspector, the report saying that "if these grounds existed for any considerable period of time prior to the accident, they should have been discovered by careful inspection and test, and corrected."

Rule 99 requires that when a train is liable to be overtaken by another train, the flagman must throw off lighted fusees at proper intervals; and the report says that if, when the freight reduced its speed in the tunnel, a fusee had been thrown off "it is believed that it would have provided a material safeguard."

Hearings on Bills to Repeal Rate Making Rule

Witnesses for Railroads and Security Owners' Association Oppose Efforts to Repeal Percentage Rule

WASHINGTON, D. C.

REPRESENTATIVES of the National Association of Owners of Railroad Securities have alternated with those of the Association of Railway Executives during the past week in testifying before the Senate committee on interstate commerce in defense of the rate-making provisions of the transportation act which have been under attack by the state railroad commissioners and by Clifford Thorne and S. H. Cowan, representing western grain and livestock shippers. Only a few senators have attended the hearing.

Edgar E. Clark, until recently chairman of the Interstate Commerce Commission, appeared as one of the witnesses for the Security Owners' Association on November 19 and strongly urged that the rate-making provisions of the act be given a fair trial. He also replied to some of the criticisms of the commission and of the law made by the previous witnesses who had demanded their repeal. "The act is a great big constructive piece of legislation," Mr. Clark said, "enacted by Congress in a broad spirit and a desire to be helpful. Insofar as it has had an opportunity to be tested it has been helpful. It has done no one any real harm and any fear of danger from it is apprehension as to what some one may do or say under it. This law is right, and deserves a fair trial. If it has been misconstrued there is a remedy for it, and that question is now before the Supreme Court."

Edgar E. Clark's Testimony

"I want to make it clear, to begin with," said Mr. Clark, "that in requesting me to appear, Mr. Warfield has made no suggestion whatever as to what position I should take; he simply asked me to come here and say what I think.

"It is doubtful if any single piece of legislation has been the subject of more comprehensive, patient and exhaustive hearings by the committees of both houses of Congress or of more exhaustive analysis by the conferees, than this transportation act. It is a piece of constructive legislation. Two provisions of it are under attack here, as to which I have been asked to express my views. One is the so-called rule for rate-making, the other is the power of the Interstate Commerce Commission to remove discrimination against interstate commerce."

Mr. Clark gave an outline of the history of rate-making from 1887, when the government decided on the policy of regulation, down to the present time, and showed that prior to the passage of the transportation act the commission lacked power as an administrative tribunal to secure results such as can be accomplished under the transportation act. Turning to the rule of rate-making, he said: "The Constitution of the United States has never guaranteed any capital invested in a public utility, any particular percentage of return, or in fact any return whatever. But it has said and does say that the owners of that utility shall not be deprived of the opportunity to earn a fair return upon the value of the property which they devote to the public use. We have a long and unbroken line of decisions of the highest courts in the country that that is the law of the Constitution . . . The rule for rate making which is here under attack, is only a statutory declaration of that constitutional provision . . . Congress was, I think, very cautious and very conservative in determining what should be taken as a reasonable return on the value of the property for the two-year period succeeding the enactment of the law. It is significant that while fixing that return of 5½ per cent, with an additional authority upon the commission to increase it to 6 per cent, in the same act the Congress provided that the carriers should pay to the government 6 per cent interest on money loaned by the government to the carriers, and should pay 6 per cent on the indebtedness of the carriers to the government which accrued during the period of government control."

Mr. Clark called attention to the fact that prior to the enactment of this law the association of security owners was anxious that Congress should declare a policy, as a rule of law to be followed by the Interstate Commerce Commission, and to control the commission in the performance of its administrative duties. "That rule of policy," said Mr. Clark, "laid down by the Congress, is in exact accord with a long line of decisions of the highest courts of the land, and in harmony with a long line of proceedings, with which the Congress was, of course, familiar."

Referring to the effort on the part of those criticising the act to repeal the principle of making rates based on the grouping of carriers, Mr. Clark asserted that this grouping had not only been established for years by the actual practice of the commission in the past in various cases, but was desirable as a general policy if Congress desired to sustain the agencies of transportation as a whole.

"The outstanding, fundamental purposes of Congress in enacting this legislation, as I see it," asserted Mr. Clark, "is that the public welfare should be paramount over all other considerations and so in the action of the commission that I have just discussed and in its other action the commission has, as directed by Congress, given special consideration to the necessities of the welfare of the commerce of the country, and of the public."

Roads Await Normal Business

With reference to the attitude of the security owners Mr. Clark said: "Now, as I have come in contact with the members of this association of security owners, I have been impressed with their conservative views. They realize that even with that rate-making provision in the act, there is no possibility of the railroads getting that measure of return until the railroads of the country, and the business of the country, have adjusted themselves so that that can be done under reasonable rates."

Senator Poindexter asked Mr. Clark: "What justification is there, Mr. Clark, for the assertion that the present conditions are the result of that provision as to guaranty?"

Mr. Clark: "Absolutely none."

Senator Poindexter: "That has been asserted throughout the country, that there is this provision as to guaranty of a profit to this particular industry, while others do not have it."

Mr. Clark: "When that statement is made, Senator, I regard it as being made in the absence of a knowledge of the facts, or with the purpose to misrepresent the facts. That it is not a guaranty is evidenced by the phraseology of the act itself, to start with; and by the interpretation that has been placed upon the act by the commission and by the railroad owners."

Denying specifically that the transportation act required the making of any rate which is unreasonable in fact, Mr. Clark quoted qualifying provisions and asserted that those fully repudiate the suggestion that the act contemplated the increase of rates without reasonable reference to the movement of traffic under them and asserted that in no instance are the shippers required, because of anything in the act, to pay an unreasonable rate, either individually or as a whole.

The other point covered by Mr. Clark related to the proposal to deprive the Interstate Commerce Commission of

jurisdiction to remove undue preferences and prejudices and unjust discrimination against interstate commerce or interstate shippers or localities. After correcting various inaccurate suggestions and misrepresentations which had been made to the Senate committee, Mr. Clark said:

"I assert that in no case in which the Interstate Commerce Commission has been called upon to exercise that power—and there have been many of them from all sections of the country—has it failed or omitted to find specifically what would be a reasonable maximum interstate rate as a basis for the removal of the discrimination.

"So that all of these statements that have been made here that either affirmatively declare or intimate that the commission has been deciding these cases without consideration of the reasonableness of the rates, both state and interstate, are based in an entire misunderstanding of what has been done—they are inaccurate, erroneous.

"I want to say with emphasis, Mr. Chairman, that any insinuation that the Interstate Commerce Commission has decided any one of these cases without according a full hearing to the people who wanted to be heard, is very far from the fact.

"I want to correct another impression that seems to have been gleaned from what has been said here, that the Interstate Commerce Commission has held that a mere difference between the state and the interstate rates constitutes undue prejudice or undue discrimination. The commission never held it in any case."

Little Opposition to Increases When Ordered

Mr. Clark said that the commission in Ex Parte 74 had undertaken as best it could to meet the requirements of the law. Everybody knew, he said, that there must be a substantial increase in rates and there was no particular criticism of its action until it became apparent a few months later that the reaction from war conditions had set in so rapidly that liquidation must take place, and then there were complaints as to the rates. Mr. Clark said he had the greatest sympathy for the producers of agricultural products who blamed the rate increase for their troubles but "they were simply mistaken." He had no sympathy, however, for "the price profiteer hiding behind the camouflage of increased rates."

"What is to be gained by repealing this provision of the law?" Mr. Clark asked. Certainly, he said, Congress is not going to do a vain thing. He felt safe in saying that even if the rate-making provisions of the law had not been enacted and other conditions were what they were, the decision in Ex Parte 74 would not have been substantially different.

Mr. Clark pointed out that of the 13 men who acquiesced in the decision in Ex Parte 74 eight were or had been state commissioners. However, he said, there was no unanimity of opinion among the state commissioners and it seemed to him beyond room for argument that if chaotic and intolerable rivalry between the states is to be avoided there must be vested some authority to settle those controversies when they arise.

"I want to deny," he said, "that the Interstate Commerce Commission has ever acted with any thought or desire of extending its jurisdiction or of dispossessing the state commissions. It has plenty of work to do without looking for more. The act gave specific authority to the commission to co-operate with the state commissions as recommended in the annual reports of the commission to Congress, and it invited the state commissions to sit with it in the biggest rate case ever heard in the world. Why, then, is the Interstate Commerce Commission accused of trying to dispossess the state commissions?"

Referring to the charges that state rates were "frozen" as the result of the orders of the commission in the intrastate cases, Mr. Clark said that a two-year order did not indicate that the commission expected no change for two years. It thought that if adjustments could be made that would remove the discrimination, he said, it would strike its order from the books. If a rate had no relation to interstate commerce, he said, and there is no discrimination, the commission will take its hands off. It has no intention of passing upon the reasonableness per se of intrastate rates. He added that in some cases the state commissions were restrained from changing their rates by court injunctions. If bills such as the Capper and Nicholson bills now before the committee were passed, he said, the effect would be to repeal the Shreveport case doctrine and every district court in the United States would become a regulator of rates.

H. A. Scandrett Testifies

Enactment of the Capper or similar bills repealing the rate-making section of the act and amending the statute so as to prohibit the Interstate Commerce Commission from adjusting state rates would nullify the Shreveport doctrine and repeal all orders involving intrastate rates that have been issued by the commission, thus resulting in general chaos so far as rates are concerned, Henry A. Scandrett, commerce counsel for the Union Pacific System, told the Senate committee.

Mr. Scandrett said the bills are revolutionary and if enacted would mean the complete reversal of the transportation act as well as the interstate commerce act and "deprive the Interstate Commerce Commission of any power over discriminatory state rates."

"Do you believe it would modify the doctrine laid down in the Shreveport case?" Senator Poindexter asked.

"It would absolutely nullify it," the witness answered. "Under the Supreme Court opinion in the Shreveport case, the commission has authority to adjust state rates where it is found that they discriminate against interstate rates," he said.

"Every order issued by the commission affecting state rates would be stricken off under the Capper bill if enacted and the present rates would be made unlawful," Mr. Scandrett said. "That is, every order would be thus nullified, no matter whether it was issued before or after the enactment of the Transportation Act."

"It would mean, then, 48 different commissions to create 48 different rates?" asked Senator Fernald of Maine.

"Absolutely and would create 48,000 discriminations," Mr. Scandrett replied.

Discrimination Against Interstate Traffic

Mr. Scandrett said that should the bills be enacted, interstate shippers would be powerless to obtain redress from discriminations. Indicating the importance of this to shippers, Alfred P. Thom, general counsel of the Association of Railway Executives, pointed out that interstate shipments constitute approximately 85 per cent of the total freight traffic carried by the railroads.

To repeal the orders of the Interstate Commerce Commission against discriminations in state rates would not only result in chaos but would also result in "guerrilla warfare" among the states in the matter of rates, with discriminations always being against the interstate shipper. Such proposed legislation if enacted, he said, would represent "backward steps, steps that should not be taken."

For a state to order the railroads, the witness said, to charge passengers one rate of fare when traveling within its borders and the Interstate Commerce Commission to permit carriers to charge another rate for interstate travel is a discrimination in violation of the Interstate Commerce Act.

"While there is competition between persons and localities," Mr. Scandrett said, "yet these advantages and prejudices would be undue and unreasonable even if it were otherwise. The burden imposed by the carrier is unequal and this the law forbids unless there is such dissimilarity in

the circumstances and conditions as warrants a difference in the fare.

"We are at a loss to understand the reason why the state commissions oppose action by the Interstate Commerce Commission, which placed state and interstate passengers' fares on a relatively fair basis. Some of the state commissions have undertaken to defend a situation which, if it arose within the state, would, I am sure, have received their very swift and very emphatic condemnation. If, for instance, with circumstances and conditions substantially similar, a railroad undertook to impose one basic fare between two points within the state and a substantially different fare between two other points also within the same state, it is inconceivable that it would be permitted to do so. The state commission would undoubtedly hold that the practice would be preferential and prejudicial as between both persons and localities. The situations presented to the Interstate Commerce Commission were on all fours with the illustration since these imaginary state lines afford no ground for distinction and there is no other difference. Just as the state commission would unquestionably say that the carriers' proposal could not be entertained, so was the Interstate Commerce Commission forced to say that the situation was intolerable and to order its correction.

Transportation Act Unfairly Criticized

"No legislation of Congress has been more severely or more unfairly criticised than the Transportation Act. This criticism has been unfair because it has charged to that act all of the evils which were the necessary aftermaths of the great war. The act has been condemned without a fair trial and in fact without any trial.

"The charge that the provisions in the act on this subject are responsible for the very difficult times through which we are passing in so far as the transportation question is concerned cannot be sustained. On the contrary, I assert that these provisions in the law are in no wise responsible for our present troubles."

Mr. Scandrett denied that the Interstate Commerce Commission had misinterpreted the law. He said that the conferees on the bill had struck out the language authorizing the Interstate Commerce Commission to change rates which caused an "undue burden" on interstate commerce, but had adopted the much broader term "unjust discrimination against interstate commerce." While the bills on their face, he said, would leave the Interstate Commerce Commission some jurisdiction over state discriminations, he said, as a practical matter they are so drawn as to actually nullify any such power and one would even set aside all orders of the Interstate Commerce Commission superseding intrastate rates since the Shreveport decision.

S. Davies Warfield's Testimony

S. Davies Warfield, president of the National Association of Owners of Railroad Securities, said that the proposed legislation, if adopted, would reopen the whole question of government ownership of the railroads. The security owners believe that this legislation, which includes the pending Capper bill and amendments which have been offered to the railroad securities bill, would destroy confidence in railroad securities and would defeat the purposes of the transportation act, one of which was to make possible the financing of the railroads other than by the government.

"If the great investing institutions," Mr. Warfield said, "are thus notified that Congress and the commission are not at least endeavoring to secure the stated reasonable return on public service property, taken in the aggregate, then the opportunity of the carriers to secure money from permanent investing sources to supply this public service will be greatly limited, and it is a grave question whether it will not reach the extent of requiring government railroad financing through taxation.

"If Congress adopts the suggestion that regulated railroad freight rates shall go down as the unregulated prices of commodities go down, unaccompanied by the requirement that freight rates shall go up as the prices of commodities go up—impracticable of accomplishment—such a policy can only be adopted, if at all, by frankly adopting at the same time the policy of supplying the deficit by taxation. Would not the operation of the railroads under such a policy become a governmental function and inevitable losses be supported by taxing all the people? No such result can be attained under private investment in railroad securities and under private operation.

"If Congress shall decide that the bare requirements essential to the transportation of an article of commerce by rail are not to be regarded as a necessary part of its cost delivered at its destination or where sold then the government should sustain the loss incident to such a policy.

"If the farmer or the owner of a private business—unregulated and free to pursue any policy in management, distribution or competition, whether sound or unsound—can secure the declaration by Congress, in effect, that their products over which Congress has no control either as to production or price, shall be carried by a railroad, privately owned but regulated by the government in its every sphere of activity for less than will produce the reasonable return now contemplated by the act, such a declaration can only be considered as a notice that railroad properties can no longer be expected to be supported through the investment of funds held in trust or by private investors.

"If the conclusion is reached that the products of any particular section of the country or of any industry should be transported, without such products bearing their just proportion of the revenue essential to operate the transportation system, as a whole, it would appear that the time has come when the loss incident to such a policy should be met by taxation. The considerations underlying such a policy would be political in character and should be supported by political authority which would be responsible for results and for the waste incident thereto or impaired service that might result.

"If the pressure upon this committee by those opposing the transportation act should result in the destruction of the machinery provided in the act for the co-ordination of the work of state commissions with that of the Interstate Commerce Commission, no policy can be adopted by the latter under which any measure of return on the aggregate value of railroad property could properly be provided for, whether named in the act or left to be named by the commission. When the government has provided regulatory agencies to regulate rates and wages, not to provide at the same time for the adjustment of intrastate rates that burden the interstate structure, would produce conditions difficult to meet through means other than by taxation."

Rates Still Being Lowered

Mr. Warfield pointed out that the railroads "have lowered and are still reducing rates, in the interest of reconstruction, not in the interest of the railroads, and when less than half the return called for by the act is realized." He said the shippers did not realize what substantial reductions are being made.

Continuing, Mr. Warfield said: "It is reliably estimated that on the volume of traffic handled last year the saving to shippers and the corresponding loss to the carriers will amount to approximately $214,000,000 per annum, which is approximately two-fifths of the total net railway operating income of all Class I railroads for the year ended August 21, 1921. With an estimated increase of 5 per cent in the

volume of business for 1922, the total railway operating income would be approximately $834,000,000 if these reductions had not been made; these reductions will, however, reduce this amount by $214,000,000 or approximately one-fourth of what would otherwise have been paid by the shippers and received by the carriers. The figures named would result in a return of 3.3 per cent on the commission's tentative valuation of the carriers as a whole. Unless there are substantial reductions made in railway operating costs it is evident that sufficient net operating revenue would not be received to maintain transportation."

Officials of mutual savings banks, representing the various sections of the country, attended the hearing and filed a protest against changes in the transportation act which would repeal the financial rate-making provisions and the provision relative to the Interstate Commerce Commission having jurisdiction over intrastate rates conflicting with the interstate structure. The paper filed was read and put in the record by George E. Brock, president of the National Association of Mutual Savings Banks of the country and also president of the Home Savings Banks, Boston, Mass., who stated the action taken was on behalf of all the mutual savings banks. There were also present representatives of leading life insurance companies.

Testimony of W. L. Fisher

"Does this committee propose to countenance conditions that will inevitably lead to government ownership of the railroads without at least an attempt to put in effect the program of intensive economies in railroad administration presented before this committee by representatives of the Association of Security Owners in January, 1919, and again in June, 1921, that will save hundreds of millions of dollars for the carriers?" asked Walter L. Fisher, of Chicago, who is one of counsel of the National Association of Owners of Railroad Securities.

"No expert is required," said Mr. Fisher, "to understand the proposals made by the security owners that by the use of the National Railway Service Corporation, organized by this association, great savings will be made that will mean substantial reductions in freight rates through the acquisition and handling of equipment for the railroads by the service corporation.

"You have asked the question," said Mr. Fisher, "how can freight rate reductions be met? We answer, adopt the program of the security owners and the farmers of the country and shippers, through the hundreds of millions of dollars of savings to be gained thereby, will get what they want in reduced freight rates without bringing this country into government ownership.

"You have placed a measure in the Transportation Act to guide the commission in rate-making. Why has this committee not considered putting into effect the other suggestions of the security owners for economies which will make large savings in railroad operation?

"A board of competent engineers and experts has been at work for months for the association in amplifying the plans which were laid before this committee. Mr. Warfield yesterday stated that if the people of the country expect rate reductions every time prices go down, private ownership must cease and taxation of the people must supply this deficit.

"Do you propose to consider changes in the Transportation Act that the much worried shipper may ask until you have at least paid some attention to the offers of the security holders to raise great sums of money to help the situation in the public interest in reciprocation for your having adopted the suggestion of the measure of return which is now part of the transportation act?"

Mr. Fisher related the history of the terminal situation in Chicago and the difficulties there in getting the representatives of the railroads to agree to joint facility uses which, he said, would mean millions of dollars saving to the railroads and hence to the shippers, and would give facilities in Chicago to which that city was entitled and had the right to demand.

F. H. Wood Appears Before Committee

On November 22 F. H. Wood, of the Southern Pacific, continued his testimony, describing in detail the evidence presented by the roads in various state cases to show that they had specifically proved discrimination against persons, places and particular classes of traffic. Senator Cummins pointed out that there is no disposition on the part of the committee to change the rule of the law relating to state discrimination as the committee thought it had been written in the law, but it has been alleged that the commission has misinterpreted the law, and that it is the duty of Congress to redraft it so it cannot be misunderstood. "That is all there is in this hearing," he said, "the question whether there has been such a misinterpretation of our language that it needs clarification. We do not intend to change the doctrine of the Shreveport, Illinois and Nebraska cases, and I do not think there is now any disposition on the part of the committee to restrain the power of the commission to remove clear cases of undue discrimination."

Mr. Wood said that he was answering the claim that had been made that the federal commission before raising state rates had taken into consideration only the mere fact of a difference in rate levels. Mr. Wood denied that state regulation of intrastate rates has been "frozen" as claimed, except in states which insisted on independent action so strongly as to try to maintain a rate level lower than that for interstate traffic or in other states. In the states which recognized with the Interstate Commerce Commission the necessity for a general increase in rates without delay, he said, the state authorities are functioning as freely as ever in the adjustment of local rates and the other states have it within their power even now to get the Interstate Commerce Commission to withdraw its general orders if they will refrain from insisting on violating the law. He said the action of many states was as much a violation of the interstate commerce act of 1887 as of the transportation act of 1920.

Courtesy of Goldwyn Pictures

Filming a Motion Picture on a Moving Train

Selecting Designs for Electric Locomotives*

Tests Indicate that Non-Symmetrical Wheel Arrangement Is Essential for Best Performance

By A. W. Gibbs
Chief Mechanical Engineer, Pennsylvania

THE EQUIPMENT available for testing included a wide variety of steam locomotives, and four electric locomotives.

The steam passenger locomotives selected were, one of the 4-4-0 or American type (Fig. 1), the other of the 4-4-2 or Atlantic type (Fig. 2).

The electric locomotives were Nos. 10,001 (Fig. 3) and 10,002 (Fig. 4) already described; No. 10,003, or American

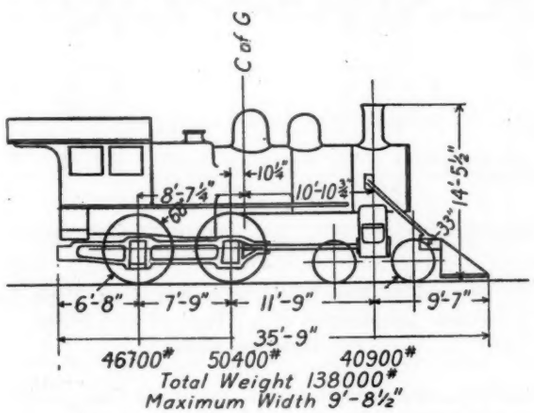


Fig. 1. American Type (4-4-0) Locomotive

type, that is, with two pair of driving wheels and a four-wheel truck (Fig. 5); and No. 028, a brand-new locomotive belonging to the New York, New Haven & Hartford, which consisted of two four-wheel trucks pivotally connected to the body which carried the draft attachments (Fig. 6).

The drives of Nos. 10,003 and 028 were very similar, consisting of a quill drive (type C).

Locomotive 10,003 was arranged for a.c. operation, which

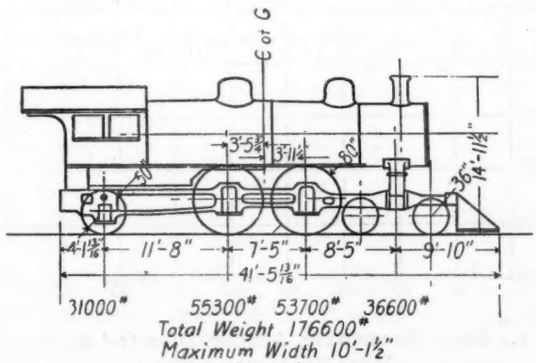


Fig. 2. Atlantic Type (4-4-2) Locomotive

necessitated provision for d.c. control operation, which was placed in a separate car that always accompanied the locomotive.

No. 028 was arranged with double control, a.c.-d.c., so as to facilitate its operation into Grand Central Terminal, New York.

Considered from various standpoints these locomotives ranked as follows:

As regards wheel-base:	Total wheel-base	Distance center to center of trucks
Electric loco. 10,003	20 ft. 7 in.	17 ft. 6 in.
Electric loco. 028	22 ft. 6 in.	14 ft. 6 in.
Steam, American type (4-4-0)	22 ft. 9½ in.	19 ft. 6 in.
Electric, 10,001 and 10,002	26 ft. 1 in.	17 ft. 7 in.
Steam, Atlantic type (4-4-2)	30 ft. 9½ in.	
Steam, Atlantic type (4-4-2)	30 ft. 9½ in.	

As regards center of gravity:	Vertically	Longitudinally
Electric loco. 10,002	42½ in. above rail	3¼ in. from center
Electric loco. 10,001	45¼ in.	Centrally
Electric loco. 028	55 in.	Centrally
Electric loco. 10,003	55 in.	1 in. ahead of front drivers
Steam, American type (4-4-0)	63 in.	10¼ in. ahead of front drivers
Steam, Atlantic type (4-4-2)	73 in.	41¼ in. ahead of rear drivers

Thus, if length of wheel-base is to govern, the Atlantic type steam locomotive is the best, and the American type electric, 10,003, should be the worst. If height of centre of gravity is to be the deciding factor, the Atlantic steam loco-

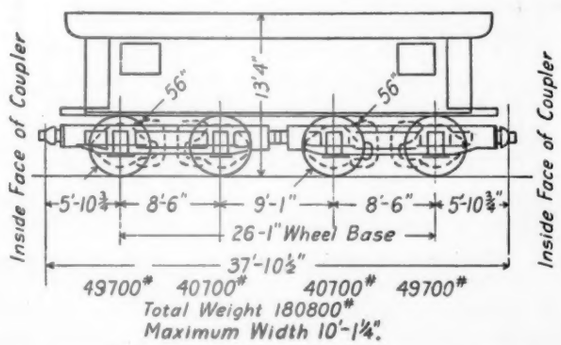


Fig. 3. Electric Locomotive No. 10,001, Geared Drive, Type B

motive is still the best, and the articulated quill-drive electric 10,002 the worst.

As the object of the trials was to determine stability at express speeds, very few of the runs were made at lower ones, but it is fair to say that with any type of locomotive, steam or electric, not much disturbance should be expected at low speed, consequently progressive speeds were selected up to the maximum speed capacities of the various locomotives.

Results of Tests

The runs with the steam locomotives went off very smoothly. Typical records are shown at different speeds for each type (Figs. 7 and 8). The maximum speed for the 4-4-0 type was 83 miles per hour, and for the 4-4-2 type, 95 miles per hour. It is not to be understood that these are practical operating speeds.

When the electric locomotives were run the story was very different, as will be seen from the diagrams (Fig. 9). The record for the geared locomotive, 10,001 (type B), shows severe oscillation with either end leading, there being three

*This is the second and concluding part of an abstract of a paper read before the Franklin Institute, Philadelphia. The previous article in the issue of November 19, page 987, described the methods used for testing the locomotive and discussed electric locomotive drives.

rather pronounced peaks at about the same space interval.

The maximum depth of impressions would indicate a lateral severity about double that with steam locomotives. It is probable that had the ties been arranged to record impressions at each end, intermediate impacts would have been shown on the opposite rail.

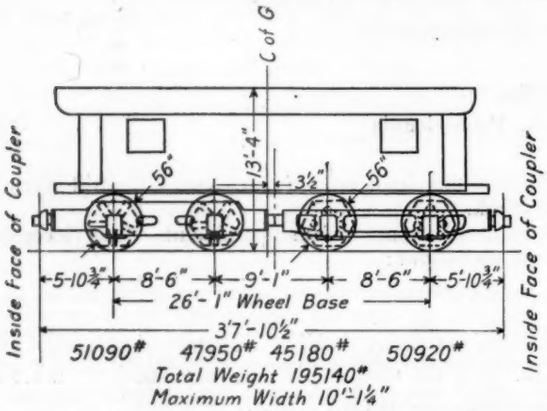


Fig. 4. Electric Locomotive No. 10,002, Quill Drive, Type C

With 10,002, articulated quill drive, the records both of

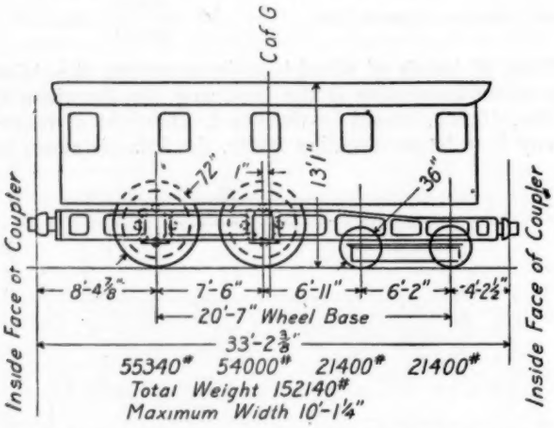


Fig. 5. Electric Locomotive No. 10,003, Quill Drive, Type C

depth of impressions and of the seismograph were decidedly the worst of all the locomotives under trial (Fig. 10). While runs were being made with this locomotive the tangent approach track began to spread, with results shown in Fig. 11.

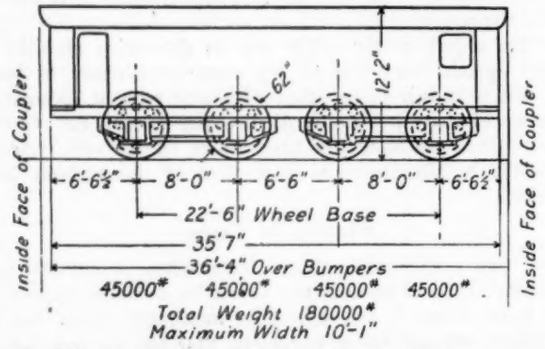


Fig. 6. Electric Locomotive No. 028, Quill Drive, Type C, with Pivoted Truck

The greatest spread was ⅞-in., which caused kinking of the rail and bending of the spikes as shown in Fig. 12. The same thing happened in varying degree where runs were made with different locomotives coupled together, but only when locomotive 10,002 happened to be one of the combination.

With the non-articulated locomotive, 028, the readings both of the impressions (Fig. 13) and of the seismograph showed a very much better performance, and so far as this set of tests went, the locomotive could not be considered bad. It was, however, tried only on the tangent track after the completion of the tests on the curve. The subsequent history of this type of locomotive in service showed that as wear accumulated the lateral oscillation became serious, so much so that the locomotives were changed by the addition of a third carrying axle to each truck, thus forming a non-

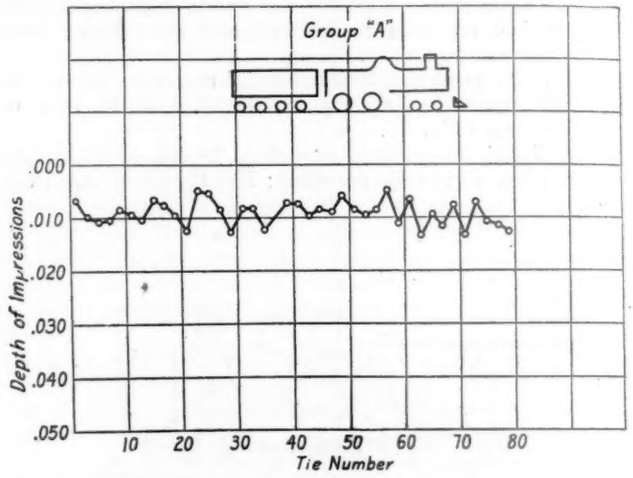


Fig. 7. Record of Run Made with American Type (4-4-0) Steam Locomotive at a Speed of 83.5 Miles Per Hour on Curve

symmetrical arrangement and at the same time providing a longer wheel-base. It is probable that the smoothness of the diagram for this locomotive was largely due to the absence of end play of the axles in their boxes.

The last of the electric locomotives, 10,003, was in fact

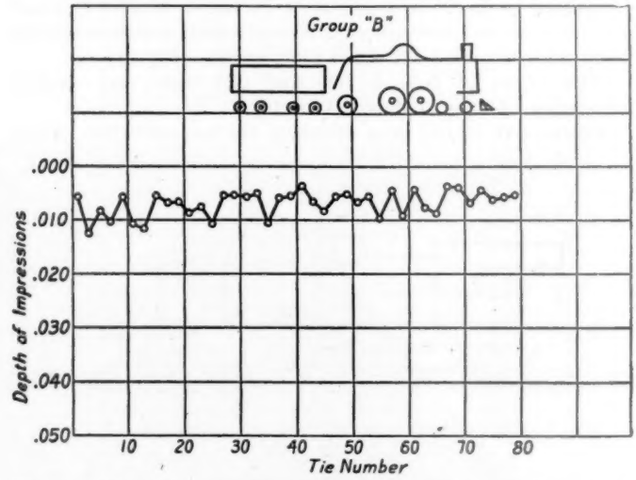


Fig. 8. Steam Locomotive, Atlantic Type (4-4-2), Speed 95.7 Miles Per Hour on Curve

an eight-wheel American-type locomotive, and the records on both curve and tangent at once put it in the class of the best steam locomotives (Fig. 14). As originally constructed the leading truck had free lateral motion, and an extensive set of runs in both directions showed that while the free swing was an advantage when the truck led, it was a disadvantage when it trailed, and that the best compromise was with truck rigid laterally.

These Franklinville tests concluded with runs of different

combinations of locomotives coupled together. Apparently when the locomotives were coupled, the number of impressions was increased without material increase in the depth.

It appeared that in all combinations, including the articulated quill-drive locomotive 10,002, the riding of the companion locomotive was worse than when operated by itself.

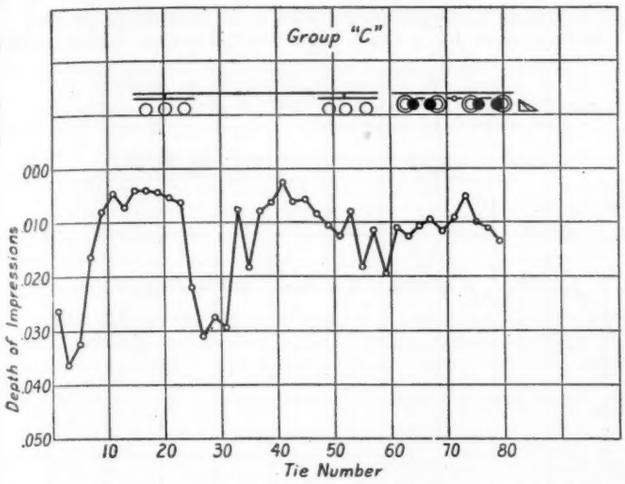


Fig. 9. Electric Geared Locomotive No. 10,001, Speed 71.5 Miles Per Hour on Curve

The influence of the approach track had a very marked effect on the results. It was evident that for best results the recording track should have been very much longer to record the resonant type of oscillations from their origin through their development to the final dampening. It was evident that ties should have been arranged to record on each end.

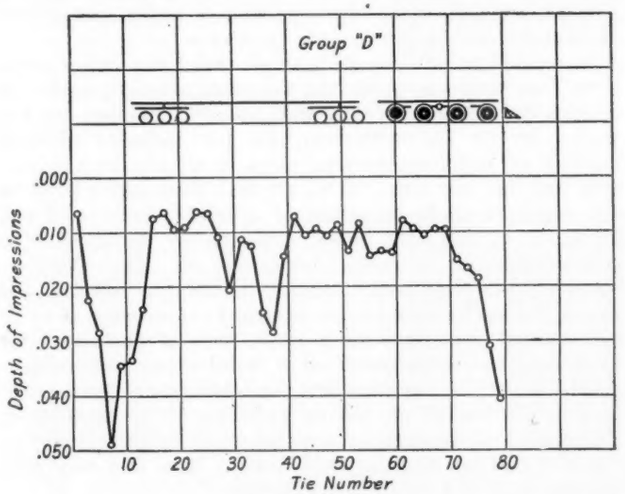


Fig. 10. Electric Locomotive No. 10,002, Speed 68.3 Miles Per Hour on Curve

The severity of the impacts from the impressions measured statically is indicated by the following notes on rail pressures at speeds above 60 miles per hour:

GROUP A—STEAM LOCOMOTIVE
No. 6034, Type D-16b (4-4-0)

Maximum readings of 6 runs, speeds between 60.07 and 83.2 M.P.H.
At 60.07 M.P.H.—Impression .0135 in.—Pressure 7,250 lb.
At 80.0 M.P.H.—Impression .0141 in.—Pressure 7,580 lb.
Average—74.3 M.P.H.—Impression .0123 in.—Pressure 6,610 lb.

GROUP B—STEAM LOCOMOTIVE
No. 6020, Type E-2 (4-4-2)

Maximum readings of 7 runs, speeds between 59.6 and 95.7 M.P.H.
At 71.2 M.P.H.—Impression .0129 in.—Pressure 6,930 lb.
At 80.8 M.P.H.—Impression .0159 in.—Pressure 6,550 lb.
Average—74.4 M.P.H.—Impression .0123 in.—Pressure 6,500 lb.

GROUP C—ELECTRIC LOCOMOTIVE No. 10,001
Forward, No. 2 End Ahead

Maximum readings of 6 runs, speeds between 61.1 and 71.3 M.P.H.
At 71.3 M.P.H.—Impression .0272 in.—Pressure 14,620 lb.
At 67.9 M.P.H.—Impression .0193 in.—Pressure 10,370 lb.
Average—64.5 M.P.H.—Impression .0165 in.—Pressure 8,870 lb.

Reversed, No. 1 End Ahead

Maximum readings of 4 runs, speeds between 60.9 and 70.1 M.P.H.
At 62 and 70.1 M.P.H.—Impression .0289 in.—Pressure 15,530 lb.
At 69.7 M.P.H.—Impression .0298 in.—Pressure 16,000 lb.
Average—65.7 M.P.H.—Impression .0267 in.—Pressure 14,350 lb.

GROUP D—ELECTRIC LOCOMOTIVE No. 10,002

Maximum readings of 4 runs, speeds between 60.8 and 68.1 M.P.H.
At 62.8 M.P.H.—Impression .039 in.—Pressure 20,960 lb.

Fig. 11. Tangent Track Kinked by Electric Locomotive No. 10,002

At 66.0 M.P.H.—Impression .0311 in.—Pressure 16,720 lb.
Average—64.4 M.P.H.—Impression .0291 in.—Pressure 15,640 lb.

GROUP E—ELECTRIC LOCOMOTIVE No. 10,003 (4-4-0)
Forward, Bolster Free

Maximum readings of 8 runs, speeds between 60.8 and 88.3 M.P.H.
At 63.3 M.P.H.—Impression .0123 in.—Pressure 6,610 lb.

Fig. 12. Spikes Bent as Result of Lateral Impact on Tangent Tracks

At 72.38 M.P.H.—Impression .0125 in.—Pressure 6,720 lb.
Average—74.1 M.P.H.—Impression .0113 in.—Pressure 6,070 lb.

Forward, Bolster Blocked

Maximum reading of 6 runs, speeds between 60.0 and 83.9 M.P.H.
At 75.1 M.P.H.—Impression .0179 in.—Pressure 9,620 lb.
At 83.9 M.P.H.—Impression .0193 in.—Pressure 10,370 lb.
Average—73.5 M.P.H.—Impression .0149 in.—Pressure 8,010 lb.

Reversed, Bolster Blocked

Maximum readings of 6 runs, speeds between 60.0 and 83.9 M.P.H.
At 65.5 and 70 M.P.H.—Impression .0115 in.—Pressure 6,180 lb.
At 68.2 M.P.H.—Impression .0117 in.—Pressure 6,290 lb.
Average—74.04 M.P.H.—Impression .0106 in.—Pressure 5,700 lb.

Reversed, Bolster Free

Maximum readings of 5 runs, speeds between 60.4 and 77.5 M.P.H.
At 68.9 M.P.H.—Impression .0289 in.—Pressure 15,530 lb.
At 70.2 M.P.H.—Impression .0281 in.—Pressure 15,100 lb.
Average—68.9 M.P.H.—Impression .0236 in.—Pressure 12,700 lb.

GROUP F—NEW HAVEN ELECTRIC LOCOMOTIVE No. 028

Maximum readings of 9 runs, speeds between 60 and 88.3 M.P.H.
At 70.7 and 72.6 M.P.H.—Impression .0197 in.—Pressure 10,370 lb.
At 70.8 M.P.H.—Impression .0180 in.—Pressure 10,000 lb.
Average—71.7 M.P.H.—Impression .0149 in.—Pressure 9,000 lb.

The outstanding fact seemed to be the superior performance of the locomotive with the non-symmetrical wheel arrangement over that with the double four-wheel motor-driven trucks. The articulated truck arrangement was undoubtedly the worst of the combinations, but how much was due to low centre of gravity and how much to the articulation setting up a snaking motion was not definitely shown.

It is to be noted that one of the double-truck motor-driven locomotives and one with two driven axles and leading truck had the same height of centre of gravity, and the latter arrangement was decidedly the better. The comparison is the more interesting because in both of these locomotives the same quill-drive type is used.

The action as the result of the tests was the condemnation

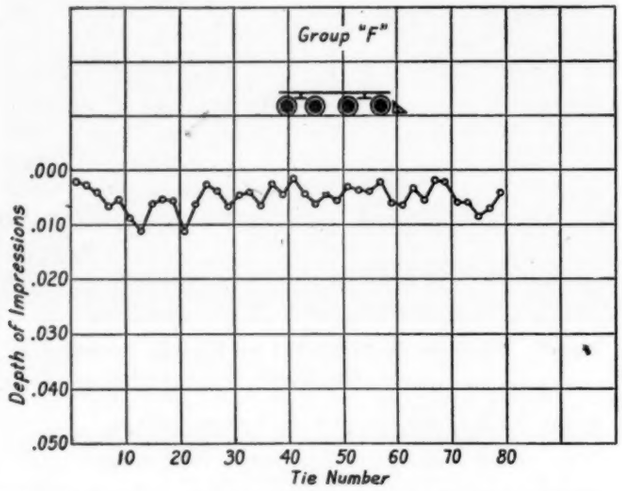


Fig. 13. Record of Impressions with Electric Locomotive No. 028 on Tangent, Speed 88.3 Miles Per Hour

of both types of articulated electric locomotives and the preparation of an entirely new design.

The new design consisted of two eight-wheel American-type locomotives coupled back to back, each driven by one motor in the cab and coupled by cranks and rods to a jack-shaft placed in the horizontal axis of the driving wheels, and coupled to them by rods, as in this case of steam locomotives (Fig. 15). In this design were embodied not only the non-symmetrical wheel spacing of each semi-unit, but also the elevation of the centre of gravity of the spring-borne portion. This design was completed and locomotives built and tested in time to start the operation of the New York terminal in 1910, and the locomotives have satisfactorily performed that service ever since.

It is not claimed that the question of stability is fully understood. The selection of available wheel arrangements was very limited, but prompt decision was imperative. It is felt that this investigation should be considered as only a starting point for a much more extensive one, which should

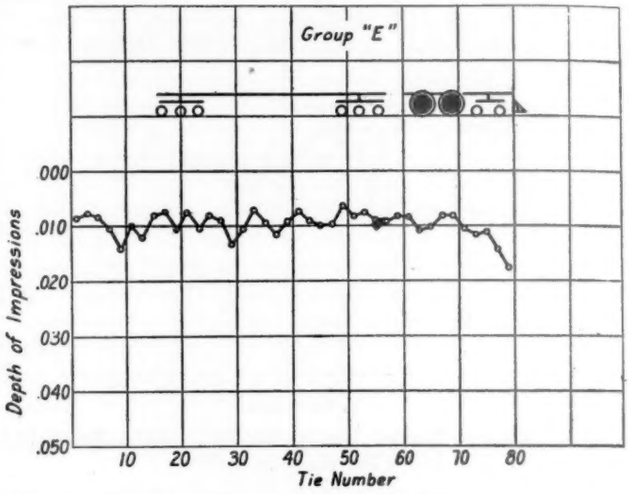


Fig. 14. Record of Impressions with Electric Locomotive No. 10,003, Speed 82.6 Miles Per Hour

determine the most desirable arrangements of wheels, of height of centre of gravity, and method of motor drive.

So far as this particular investigation was concerned, the question of electric system was not involved, but, of course, a full discussion of the characteristics of steam and electric locomotives cannot ignore such questions.

Since this set of tests with single-ended ties, other series have been made in which the ties were arranged to record at each end. More ties were used so as to lengthen the test track. As for the equipment, the test included different methods of coupling the semi-units or electric locomotives; also studying the effect of depressions purposely placed in the approach track, the effect of different amounts of end clearance in the axle boxes, variation in the amount of counterbalancing in steam locomotives, etc. The whole accumulation of data is too voluminous to be included in one paper. Although considerable practical information of value has resulted from the various trials, there is much work yet to be done before the questions of stability are really understood. It is to be regretted that the selection of electric locomotives did not include greater variations in the wheel-base, the method of articulation and height of centre of gravity, but it is believed that the work already done is a very good starting point for future investigations.

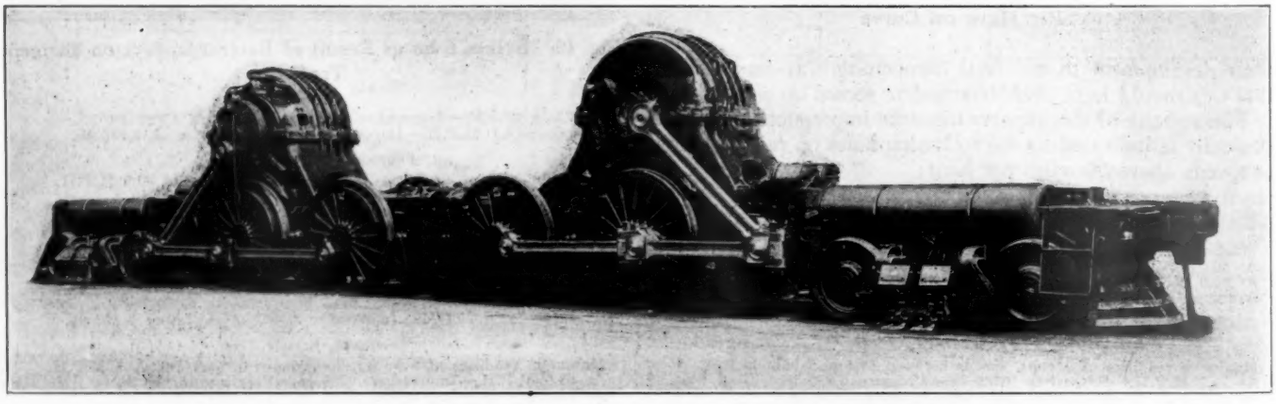


Fig. 15. Chassis of Electric Locomotive Finally Adopted

General News Department

The Chicago & North Western will charge the dependents of employees half the regular suburban fare, the new ruling becoming effective January 1. Dependents of employees heretofore have been given passes.

A deficiency appropriation has been reported to the House of Representatives which provides for an additional appropriation of $300,181 for the Interstate Commerce Commission to enable it to carry out the additional functions imposed by the transportation act.

John Barry, identified as one of the principals in the Dearborn station mail robbery at Chicago, and believed to have been implicated in the hold-up of an Illinois Central train at Paxton, Ill., on November 7, has been taken into custody at Chicago and his capture, it is believed, will clear up many of the recent mail robberies in the middle west.

The Signal Section of the American Railway Association, according to an announcement of the Committee of Directors, is to hold its annual meeting next year on June 14, 15 and 16, at Monmouth Hotel, Spring Lake, New Jersey. Spring Lake is on the New York & Long Branch, 10 miles south of Long Branch and 55 miles from New York City.

Hearings on Bill to Abolish Cost of Acquiring Land in Valuation Estimates

The House committee on interstate and foreign commerce has been holding hearings on a bill introduced by Representative Sweet to amend the valuation law to strike out the requirement that the commission report the cost of acquisition of land. Testimoney has been given by representatives of the carriers and by John E. Benton, representing the state commissions. The hearings were postponed on November 22 until the next session of Congress.

New Shop Craft Rules To Be Announced By Labor Board

New rules regarding the working conditions of shop employees are to be announced by the Railroad Labor Board in time to be placed in effect before December 1, according to a recent announcement made at the Board's headquarters at Chicago. The inclusion of these new rules in the agreements formed between the various carriers and their shop employees will end the long controversy over the shop crafts national agreement, all of the points in dispute having been disposed of by this and previous rulings of the Board.

Five Santa Fe Officers Killed

In the derailment of a motor inspection car near Wickenburg, Ariz., on November 22, W. H. Oliver, engineer of the Coast Lines Grand Division of the Atchison, Topeka & Santa Fe, with four division officers was killed, and several persons were injured. The car is said to have been filled to its capacity of fourteen persons. The dead, besides Mr. Oliver, are: William Matthie, division superintendent; H. C. Storey, assistant division superintendent; William Bowman, roadmaster and J. A. Jaeger, assistant division engineer. The accident happened, according to those on board the car, when an axle broke at a curve. The car plunged down an eight-foot embankment and was overturned.

Bangor & Aroostook Leases Car Shops

The car shop of the Bangor & Aroostook at Houlton, Me., which normally employs between 30 and 40 men, has been leased to A. E. Astle, Houlton, Me., who will make repairs to cars on a contract basis. This action was taken because output had been unsatisfactory and the size of the shops did not warrant additional expense for supervision. The railroad estimates that the new arrangement will effect a saving to the company in labor costs of approximately 10 per cent.

Urges Strike Referendum Among Women in Employees' Families

Following an address before the Ohio Newspaper Women's Association at the Hotel Sinton, Cincinnati, Ohio, on November 13, by Allen Rogers, publicity director of the Cleveland, Cincinnati, Chicago & St. Louis, the association passed a resolution directing the secretary of the organization to write to the railroad brotherhoods, the Railroad Labor Board and the railway executives as well as other bodies, presenting the plea that when strike questions arise the strike vote referendum should include the women members of the families of the union men involved, as well as the workers themselves.

North Western Shop Employees Agree to Five-Day Week

The shop employees of the Chicago & North Western have agreed with officers of that carrier to accept a lay-off of one day each week in order to avoid a reduction in forces made necessary, according to the management, because of light business. The men were informed recently that a 10 per cent cut in the shop forces would be necessary and the men were offered an opportunity to choose between retaining a full force on a five-day per week basis or retaining 90 per cent of the force on a six-day per week basis. The employees voted to accept the five-day week.

Hawkinsville & Florida Southern Discontinues

The Hawkinsville & Florida Southern Railway, which has been operated by R. B. Pegram, receiver, has discontinued business, passenger trains having been taken off on November 15, and freight trains on November 22. This discontinuance of operation was authorized by the Interstate Commerce Commission, as heretofore noted, and also by the Superior Court of Bibb County, Georgia. The line extends from Hawkinsville, Ga., southward to Camilla, Ga., 95 miles. Seven of the intermediate towns (as well as the termini) have other railroad connections, as follows: Pope City, 18 miles from Hawkinsville; Pitts, 25 miles; Double Run, 31 miles; Worth, 42 miles; Ashburn, 46 miles; Sylvester, 63 miles and Bridgeboro, 76 miles.

Clearing of Labor Board's Docket in Sight

The following announcement was made by the Railroad Labor Board on November 21:

"The Railroad Labor Board has disposed of exactly six times as many cases in the last few months as it did in the first period of its existence. The Board was organized in April, 1920. It disposed of 100 cases from April 15 to November 30, 1920. In the same period this year—April 15 to November 15, 1921—it disposed of exactly 600 cases. The round numbers, by an unusual coincidence, represent the actual number of cases carried through to a final decision.

"The increased number of cases disposed of indicates not only the greater rapidity of the Board's work but also how its volume has increased.

"With the recent disposal of 200 cases and the prospect that the new adjustment boards will handle a large amount of the grievance cases which have heretofore been brought before the Board, the clearing of the Board's docket may be said to be in sight."

Operating Statistics of Large Steam Roads—Selected Items for the Month of September, 1921,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1921 394	222,944	243,619	31,104	4,355	68.8	217,599	87,374	123	28	18.8	...
	1920 394	307,910	326,929	31,546	5,269	68.1	292,210	132,723	131	31	19.2	...
Boston & Maine	1921 2,469	509,592	568,885	48,773	11,634	73.0	570,463	235,666	336	123	26.8	42
	1920 2,469	745,082	827,275	86,385	15,105	71.0	839,036	384,579	374	96	20.5	1
N. Y., N. H. & H.	1921 1,960	409,359	444,155	29,366	10,322	71.4	507,400	215,823	307	75	19.6	44
	1920 1,965	538,570	560,115	40,050	11,751	74.7	610,438	290,804	331	81	19.7	...
Great Lakes Region:												
Delaware & Hudson	1921 880	316,197	415,561	31,014	8,213	64.3	525,997	261,416	275	39	12.3	121
	1920 881	416,610	593,593	39,519	10,859	67.2	728,833	392,054	258	45	14.7	19
Del., Lack. & Western	1921 995	508,856	629,732	119,170	15,688	68.7	854,488	393,090	298	56	15.8	45
	1920 997	561,967	684,343	131,898	17,263	70.2	984,036	489,639	313	70	18.2	...
Erie (inc. Chic. & Erie)	1921 2,259	1,019,253	1,156,496	65,233	33,911	66.1	2,001,461	889,240	560	178	24.1	35
	1920 2,259	1,147,179	1,300,091	47,727	36,521	64.2	2,237,915	1,028,636	578	113	16.4	8
Lehigh Valley	1921 1,430	582,490	640,254	61,403	16,635	63.9	1,009,738	471,334	423	120	22.0	121
	1920 1,429	594,646	662,107	63,213	17,014	66.9	1,053,982	533,551	413	182	30.6	92
Michigan Central	1921 1,829	444,683	452,525	17,742	13,846	66.9	729,114	285,752	325	87	21.1	101
	1920 1,826	572,872	598,611	20,162	18,227	70.8	981,608	456,503	327	83	20.2	...
New York Central	1921 5,655	1,679,163	1,860,340	134,651	60,063	65.1	3,406,024	1,461,923	1,015	605	37.4	233
	1920 5,646	2,136,566	2,461,979	186,860	77,057	62.5	4,759,069	2,253,459	(1)	(1)	(1)	(1)
N. Y., Chic. & St. L.	1921 572	328,595	329,944	802	10,219	68.2	523,418	203,789	118	40	25.2	46
	1920 573	418,091	421,246	881	12,033	75.0	625,800	296,942	115	46	28.5	13
Pere Marquette	1921 2,196	350,212	360,485	6,652	8,788	67.8	488,415	220,577	162	42	20.5	12
	1920 2,208	373,240	380,993	6,119	9,285	74.7	502,760	254,437	159	39	19.7	...
Pitts. & Lake Erie	1921 228	74,487	78,523	1,066	2,547	64.6	176,853	101,283	54	32	37.1	13
	1920 225	164,033	170,042	8,903	6,474	68.1	459,523	272,678	66	11	13.7	...
Wabash	1921 2,418	574,617	604,735	8,797	16,307	71.0	855,519	370,177	280	67	19.4	44
	1920 2,418	641,881	659,697	8,497	18,424	77.0	973,094	474,144	268	68	20.2	6
Ohio-Indiana-Allegheny region:												
Baltimore & Ohio	1921 5,185	1,610,416	1,728,245	131,716	41,319	64.2	2,597,692	1,287,832	1,023	368	26.5	222
	1920 5,154	2,115,904	2,368,405	116,071	55,924	65.8	3,810,866	2,050,026	1,109	200	15.3	16
Central of N. J.	1921 679	272,477	303,625	39,842	6,142	61.0	389,338	195,970	204	56	21.6	14
	1920 679	332,240	356,857	34,101	6,785	65.0	437,753	224,564	223	46	17.0	...
Chicago & Eastern Ill.	1921 1,131	234,017	237,042	3,721	5,659	62.4	346,611	173,221	125	48	27.8	42
	1920 1,131	308,765	320,237	5,757	7,663	67.0	471,685	249,153	140	52	27.3	1
C., C., C. & St. L.	1921 2,382	628,503	651,439	3,000	17,513	60.2	1,076,625	514,993	302	143	32.2	33
	1920 2,394	748,866	784,493	428	21,287	63.7	1,350,686	634,010	298	71	19.2	...
Elgin, Joliet & Eastern	1921 837	89,389	97,057	5,044	2,737	65.7	203,086	109,370	99	9	8.2	40
	1920 836	159,827	177,699	13,132	4,931	70.2	352,244	196,417	93	13	12.5	...
Long Island	1921 395	43,726	48,480	8,211	553	60.0	31,387	12,299	36	11	23.6	1
	1920 395	43,265	56,349	12,980	508	64.2	26,078	10,390	38	9	19.1	...
Pennsylvania System	1921 10,877	3,898,149	4,230,621	306,502	102,249	64.6	6,790,417	3,405,133	2,628	851	24.5	691
	1920 10,839	5,149,256	5,704,540	445,916	134,889	67.3	8,998,624	4,897,584	2,216	833	27.3	13
Phila. & Reading	1921 1,120	513,295	574,749	66,531	12,837	63.8	848,505	442,946	374	79	17.5	163
	1920 1,119	653,603	760,595	106,151	15,790	63.6	1,086,026	598,308	290	91	23.9	7
Pocahontas Region:												
Chesapeake & Ohio	1921 2,548	633,978	697,906	20,164	17,846	57.3	1,396,955	745,595	458	105	18.7	124
	1920 2,520	887,009	974,766	26,964	26,960	59.1	2,053,354	1,120,448	407	127	23.7	...
Norfolk & Western	1921 2,222	663,538	817,266	27,787	18,249	59.7	1,368,066	739,914	618	92	13.0	203
	1920 2,189	861,272	1,107,099	43,329	24,307	61.9	1,867,919	1,038,750	501	179	26.3	56
Southern Region:												
Atlantic Coast Line	1921 4,886	475,893	480,905	6,127	10,521	68.3	525,620	212,006	297	123	29.2	72
	1920 4,888	561,291	564,003	8,787	12,342	71.4	639,624	284,943	302	137	31.2	...
Central of Georgia	1921 1,908	204,668	205,531	2,304	4,547	73.7	220,072	98,136	115	20	14.5	25
	1920 1,913	262,668	264,709	4,925	5,011	73.1	266,085	129,026	108	19	14.6	...
I. C. (inc. Y. & M. V.)	1921 6,151	1,520,231	1,527,024	31,219	41,849	65.8	2,544,299	1,156,839	717	94	11.6	11
	1920 6,151	1,936,475	1,942,068	35,514	49,342	65.3	3,160,256	1,515,198	681	109	13.8	15
Louisville & Nashville	1921 5,020	1,466,213	1,571,063	55,472	25,895	61.1	1,678,923	800,196	558	96	14.6	37
	1920 5,024	1,597,333	1,725,825	60,177	27,847	65.3	1,759,232	886,425	542	113	17.2	...
Seaboard Air Line	1921 3,537	360,279	371,693	7,211	7,796	75.3	375,768	161,069	170	91	34.9	4
	1920 3,537	422,531	429,357	10,253	9,229	74.3	485,173	226,293	171	90	34.5	2
Southern Ry.	1921 6,942	1,165,697	1,186,721	27,886	25,969	71.1	1,315,603	560,426	897	229	20.3	64
	1920 6,942	1,513,312	1,543,218	41,849	30,897	65.9	1,733,636	764,814	898	210	19.0	1
Northwestern Region:												
C. & N. W.	1921 8,342	1,606,528	1,658,635	24,916	34,360	62.1	2,005,483	820,553	790	281	26.2	28
	1920 8,323	1,877,307	1,916,279	24,148	41,962	66.0	2,451,766	1,220,583	698	237	25.3	...
C., M. & St. P.	1921 10,992	1,605,995	1,649,635	63,233	38,629	62.5	2,212,998	982,685	860	213	19.8	132
	1920 10,626	1,827,448	1,888,827	85,636	46,863	67.6	2,573,126	1,201,832	676	280	29.3	2
C., St. P., M. & O.	1921 1,726	325,402	341,803	14,208	6,373	72.3	334,575	146,995	151	61	28.9	18
	1920 1,726	336,630	353,054	15,718	6,764	78.1	344,603	162,392	164	46	22.0	19
Great Northern	1921 8,163	936,678	960,266	31,793	26,134	63.4	1,577,662	745,549	590	198	25.1	166
	1920 8,172	1,112,105	1,148,148	40,023	32,660	61.6	2,022,443	989,363	526	191	26.6	33
M., St. P. & S. Ste. M.	1921 4,359	495,685	527,098	8,101	11,298	69.0	580,968	267,936	345	59	14.5	10
	1920 4,227	577,480	583,054	6,930	12,806	70.1	690,385	331,038	335	75	18.2	26
Northern Pacific	1921 6,408	908,277	954,811	60,223	25,395	64.2	1,490,234	657,601	567	160	22.0	82
	1920 6,411	1,054,622	1,111,090	72,933	29,104	68.5	1,650,201	793,276	531	132	19.9	12
Ore.-Wash. R. R. & Nav.	1921 2,205	238,900	265,017	34,203	5,754	70.2	347,282	172,763	126	31	19.9	...
	1920 2,146	249,837	277,554	33,266	6,114	72.3	342,103	172,047	121	37	23.5	...
Central Western Region:												
Atch., Top. & Santa Fe	1921 9,762	1,739,406	1,858,809	94,273	47,214	63.2	2,740,451	979,648	762	210	21.6	82
	1920 9,708	1,764,119	1,849,968	78,796	47,031	67.0	2,611,597	1,062,582	685	243	26.2	9
Chicago & Alton	1921 1,010	359,557	366,791	5,208	7,864	62.5	470,827	215,337	116	35	23.3	17
	1920 1,010	348,356	355,541	6,026	7,593	66.9	450,824	195,020	100	55	35.4	1
Chic., Burl. & Quincy	1921 9,326	1,573,667	1,653,347	77,736	41,334	63.6	2,482,580	1,180,249	677	266	28.2	73
	1920 9,304	1,812,013	1,892,723	93,171	49,017	64.2	2,945,691	1,423,102	655	261	28.5	...
Chic., Rock Isl. & Pacific	1921 7,661	1,432,117	1,463,060	12,960	30,835	68.8	1,717,448	792,187	596	165	21.7	19
	1920 7,663	1,388,240	1,415,006	10,859	28,881	71.6	1,545,829	721,933	487	195	28.5	8
Denver & Rio Grande West.	1921 2,593	307,679	381,563	70,177	6,655	63.9	397,848	175,957	239	65	21.4	9
	1920 2,604	353,940	440,149	88,087	7,669	66.9	451,642	210,568	230	72	23.9	2
Oregon Short Line	1921 2,359	433,907	445,705	24,959	10,196	61.0	653,071	284,372	167	44	20.9	29
	1920 2,359	460,682	478,611	31,209	10,910	65.3	649,829	305,631	182	65	26.2	1
Southern Pacific	1921 6,975	1,156,802	1,307,818	237,028	32,514	68.5	1,840,508	759,045	582	186	24.2	18
	1920 6,970	1,445,619	1,633,462	271,757	39,037	73.8	2,163,837	972,559	632	131	17.1	1
Union Pacific	1921 3,615	1,383,661	1,397,535	65,153	39,092	63.0	2,283,759	849,077	416	116	21.8	26
	1920 3,614	1,660,720	1,684,428	74,614	45,243	68.7	2,502,978	1,069,742	423	103	19.6	1
Southwestern Region:												
Gulf, Colo. & Santa Fe	1921 1,895	286,441	293,624	7,346	6,862	66.2	407,707	192,445	133	35	20.8	15
	1920 1,895	277,180	284,166	6,404	6,516	69.8	373,392	177,510	106	42	28.4	4
Missouri, Kans. & Texas	1921 1,709	253,129	253,290	6,675	6,735	61.0	380,756	152,056	138	42	23.4	49
	1920 1,710	323,187	325,957	5,325	7,610	60.0	445,531	180,069	118	52	30.5	1
Mo., Kans. & Tex. of Tex.	1921 1,740	232,611	237,715	2,660	4,448	62.3	259,758	109,050	94	41	30.2	16
	1920 1,740	273,958	279,096	4,179	5,019	66.0	289,238	129,117	103	35	25.6	1
Missouri Pacific	1921 7,264	1,187,097	1,197,006	34,856	28,251	67.8	1,595,140	712,336	408	153	27.3	1
	1920 7,263	1,164,711	1,172,426	36,728	27,789	71.6	1,564,379	746,953	401	147	26.8	...
St. Louis-San Francisco	1921 4,761	750,131	761,038	10,807	13,667	67.1	767,791	337,423	344	97	22.0	26
	1920 4,757	938,394	947,407	17,875	16,100	65.2	929,304	411,146	380	95	20.0	...
Southern Pacific Lines (in Texas & Louisiana)	1921 3,657	514,537	516,863	4,142	10,387	62.9	628,257	268,110	172	116	40.3	4
	1920 3,642	625,482	633,318	3,685	13,399	68.5	782,558	369,872	193	104	35.1	2
Texas & Pacific	1921 1,953	239,324	239,324	1,147	5,653	68.3	296,449	115,842	121	71	36.9	28
	1920 1,947	345,044	345,044	3,801	7,313	67.3	411,598	177,468	138	69	33.1	12

(1) Includes Chicago, Terre Haute & Southeastern from July 1, 1921, only.

Compared with September, 1920, for Roads with Annual Operating Revenues above $25,000,000

Region, road and year	Cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per car	Net ton miles per car-day	Car-miles per car-day	Net ton miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger service: Train-miles	Passenger train car-miles
New England Region:														
Boston & Albany.....1921	3,197	4,088	7,285	7.9	578	976	392	20.1	400	28.9	7,393	206	302,876	2,092,453
1920	703	7,913	8,616	4.3	.....	949	431	25.2	513	29.9	11,231	206	324,479	2,095,855
Boston & Maine.....1921	17,724	13,086	30,810	21.0	1,724	1,119	462	20.3	255	17.2	3,182	144	898,436	5,134,820
1920	7,839	28,565	36,404	9.3	.....	1,126	516	25.5	352	19.5	5,192	...	961,785	5,671,780
N. Y., N. H. & H.....1921	24,401	14,241	38,642	25.9	1,480	1,239	527	20.9	186	12.5	3,671	156	1,089,745	7,197,994
1920	9,713	33,516	43,229	9.4	.....	1,133	540	24.7	224	12.1	4,934	186	1,226,683	7,961,042
Great Lakes Region:														
Delaware & Hudson.....1921	10,521	5,239	15,760	13.5	324	1,664	827	31.8	553	27.0	9,898	182	197,626	1,103,353
1920	5,559	13,073	18,632	6.3	.....	1,749	941	36.1	701	28.9	14,840	187	205,325	1,168,698
Del., Lack. & Western....1921	17,459	8,362	25,821	15.7	.....	1,679	773	25.1	507	29.5	13,174	164	501,387	3,799,663
1920	5,316	20,382	25,698	5.0	.....	1,751	871	28.4	635	31.9	16,375	...	502,944	3,799,254
Erie (inc. Chic. & Erie)..1921	37,013	16,591	53,604	21.4	4,484	1,964	872	26.2	553	31.9	13,123	137	679,477	5,093,716
1920	9,627	47,783	57,410	6.4	.....	1,951	897	28.2	597	33.0	15,180	144	704,394	5,366,046
Lehigh Valley 1921	30,669	8,686	39,355	14.2	1,918	1,733	809	28.3	399	22.0	10,984	155	354,474	2,804,360
1920	10,265	26,372	36,637	9.4	.....	1,773	897	31.4	485	23.1	12,445	176	378,587	3,053,680
Michigan Central 1921	18,772	14,269	33,041	22.4	165	1,640	643	20.6	288	20.9	5,207	119	589,613	5,694,157
1920	4,652	26,978	31,630	7.5	.....	1,714	797	25.0	481	27.1	8,335	...	625,309	5,784,565
New York Central.....1921	80,974	49,286	130,260	20.9	6,283	2,028	871	24.3	374	23.6	8,617	116	2,405,706	20,556,322
1920	31,603	124,564	156,167	7.4	.....	2,227	1,055	29.2	481	26.3	13,303	...	2,622,502	21,297,777
N. Y., Chic. & St. L.....1921	4,434	4,681	9,115	16.0	642	1,593	620	19.9	745	54.8	11,873	101	86,904	556,694
1920	1,603	10,461	12,064	7.5	.....	1,497	710	24.7	820	44.3	17,286	...	86,266	589,151
Pere Marquette 1921	11,087	12,051	23,138	18.2	200	1,395	630	25.1	318	18.7	3,348	134	319,448	1,659,013
1920	4,240	18,868	23,108	6.6	.....	1,347	682	27.4	367	17.9	3,841	158	331,007	1,850,432
Pitts. & Lake Erie.....1921	19,521	7,913	27,434	38.6	1,199	2,374	1,360	39.8	123	4.8	14,813	85	100,842	551,679
1920	3,709	21,596	25,305	12.5	.....	2,801	1,662	42.1	359	12.5	40,476	68	112,273	599,976
Wabash 1921	12,221	11,348	23,569	9.2	618	1,489	644	22.7	524	32.5	5,104	148	512,784	2,841,856
1920	5,362	22,466	27,828	7.8	.....	1,516	739	25.7	568	28.7	6,537	160	557,582	3,013,539
Ohio-Indiana-Allegheny region:														
Baltimore & Ohio.....1921	67,695	32,097	99,792	11.7	3,471	1,613	800	31.2	430	21.5	8,280	176	1,382,663	8,971,358
1920	26,145	84,434	110,579	6.5	.....	1,801	969	36.7	618	25.6	13,260	...	1,354,551	8,595,326
Central of N. J.....1921	19,427	8,075	27,502	18.3	4,198	1,429	719	31.9	238	12.2	9,627	164	362,925	1,822,833
1920	6,531	17,996	24,527	13.0	.....	1,318	676	33.1	305	14.2	11,029	...	368,968	1,684,585
Chicago & Eastern Ill....1921	14,238	3,425	17,663	14.0	1,200	1,481	740	30.6	327	17.1	5,105	153	216,957	1,450,218
1920	5,356	9,638	14,994	14.2	.....	1,528	807	32.5	554	25.4	7,343	...	233,269	1,494,969
C., C., C. & St. L.....1921	16,279	16,601	32,880	11.3	262	1,713	819	29.4	522	29.5	7,206	128	683,329	4,278,836
1920	5,575	30,324	35,899	7.3	.....	1,804	847	29.8	589	31.0	8,828	...	768,116	4,830,465
Elgin, Joliet & Eastern...1921	10,398	2,951	13,349	7.7	938	2,272	1,224	40.0	273	10.4	4,358	118	(2)	(2)
1920	8,688	5,434	14,122	7.7	.....	2,204	1,229	39.8	464	16.6	7,836	...	(2)	(2)
Long Island 1921	1,997	3,576	5,573	4.5	166	718	281	22.2	74	5.5	1,039	315	222,991	1,341,050
1920	563	4,877	5,440	3.7	.....	603	240	20.5	64	4.8	878	...	224,768	1,396,443
Pennsylvania System 1921	215,613	69,040	284,653	15.4	50,417	1,742	874	33.3	399	18.5	10,435	135	5,144,772	34,715,229
1920	104,922	191,379	296,301	3.3	.....	1,748	951	36.3	551	22.5	15,062	...	5,476,788	37,448,814
Phila. & Reading.....1921	26,228	11,387	37,615	5.8	7,273	1,653	863	34.5	393	17.8	13,188	179	490,351	2,249,731
1920	7,927	31,798	39,725	5.2	.....	1,662	915	37.9	502	20.8	17,819	...	518,355	2,445,992
Pocahontas Region:														
Chesapeake & Ohio.....1921	39,774	10,549	50,323	10.3	800	2,204	1,176	41.8	494	20.6	9,753	125	436,313	2,503,426
1920	14,184	26,630	40,814	10.6	.....	2,315	1,263	41.6	915	37.2	14,821	...	432,855	2,498,432
Norfolk & Western.....1921	33,616	5,784	39,400	9.5	3,850	2,062	1,115	40.5	626	25.9	11,102	163	399,796	2,634,346
1920	16,155	21,331	37,486	6.9	.....	2,169	1,206	42.7	924	34.9	15,820	...	399,651	2,820,061
Southern Region:														
Atlantic Coast Line.....1921	21,671	6,400	28,071	23.6	.....	1,104	445	20.2	252	18.3	1,446	132	672,594	3,989,392
1920	7,420	17,642	25,062	10.9	.....	1,140	508	23.1	379	23.0	1,943	...	717,256	4,427,229
Central of Georgia.....1921	4,369	3,167	7,536	14.3	.....	1,075	479	21.6	434	27.3	1,714	151	303,967	1,447,230
1920	1,660	6,860	8,520	4.2	.....	1,013	491	25.7	505	26.8	2,249	...	292,488	1,482,709
I. C. (inc. Y. & M. V.)..1921	42,759	20,083	62,842	11.7	2,980	1,674	761	27.6	614	33.7	6,269	126	1,397,642	8,079,178
1920	13,416	44,146	57,562	5.1	.....	1,632	782	30.7	877	43.8	8,210	...	1,368,595	8,308,775
Louisville & Nashville...1921	39,556	15,894	55,450	28.2	91	1,145	546	30.9	481	25.5	5,313	158	911,889	5,348,161
1920	16,041	31,165	47,206	11.2	71	1,101	555	31.8	626	30.1	5,882	...	888,034	5,312,895
Seaboard Air Line.....1921	11,943	6,867	18,810	30.8	.....	1,046	447	20.7	285	18.4	1,518	183	538,269	3,097,280
1920	4,126	13,192	17,318	10.1	.....	1,148	536	24.5	436	23.9	2,132	175	539,997	2,929,414
Southern Ry. 1921	38,512	19,730	58,242	13.1	1,108	1,129	481	21.6	321	20.9	2,691	197	1,283,469	7,651,453
1920	15,861	40,039	55,900	3.9	.....	1,146	505	24.8	456	28.0	3,673	...	1,433,477	9,096,490
Northwestern Region:														
C. & N. W.....1921	47,977	26,601	74,578	9.3	.....	1,248	511	23.9	367	24.7	3,279	160	1,600,517	10,375,509
1920	29,494	52,072	81,566	7.9	.....	1,306	650	29.1	499	26.0	4,889	...	1,694,979	10,896,495
C., M & St. P.1.....1921	48,640	27,915	76,555	17.9	1,555	1,378	612	25.4	428	26.9	2,980	152	1,492,184	9,496,437
1920	21,710	43,909	65,619	7.4	.....	1,408	658	25.6	611	35.2	3,770	...	1,403,259	9,524,748
C., St. P., M. & O.....1921	4,079	12,293	16,372	13.3	942	1,028	452	23.1	299	18.0	2,838	157	309,681	1,843,066
1920	2,515	10,014	12,529	10.6	.....	1,024	482	24.0	432	23.0	3,136	...	319,906	2,040,579
Great Northern 1921	45,949	7,880	53,829	11.8	.....	1,684	796	28.5	462	25.5	3,045	149	974,546	6,022,613
1920	25,895	26,753	52,648	8.4	.....	1,819	890	30.3	626	33.5	4,036	...	986,721	6,528,566
M., St. P. & S. Ste. M...1921	20,646	5,692	26,338	12.1	4,419	1,172	541	23.7	339	20.7	2,049	124	436,146	2,728,109
1920	8,629	12,898	21,527	8.8	191	1,196	573	25.9	513	28.3	2,611	126	428,418	2,639,295
Northern Pacific 1921	36,297	8,805	45,102	16.0	1,388	1,641	724	25.9	486	29.2	3,421	125	836,669	5,856,361
1920	21,173	19,702	40,875	9.4	.....	1,565	752	27.3	647	34.6	4,125	130	875,945	6,491,839
Ore.-Wash. R. R. & Nav.1921	7,500	3,639	11,139	2.9	778	1,454	723	30.0	517	24.5	2,611	216	250,639	1,772,123
1920	2,905	5,071	7,976	4.6	.....	1,369	689	28.1	719	35.3	2,672	...	231,848	1,740,390
Central Western Region:														
Atch., Top. & Santa Fe..1921	48,112	12,799	60,911	10.5	4,827	1,576	563	20.7	536	40.9	3,345	138	1,558,855	11,938,863
1920	23,103	39,489	62,592	8.7	.....	1,480	602	22.6	566	37.4	3,648	143	1,609,390	13,027,934
Chicago & Alton.....1921	9,823	5,323	15,146	3.7	100	1,309	599	27.4	474	27.7	7,105	171	286,846	1,674,213
1920	2,871	13,687	16,558	3.0	.....	1,294	560	25.7	393	22.9	6,435	197	301,010	1,737,510
Chic., Burl. & Quincy....1921	47,078	21,350	68,428	13.0	.....	1,578	750	28.6	575	31.6	4,219	154	1,501,944	10,297,086
1920	20,339	48,957	69,296	8.1	.....	1,626	785	29.0	685	36.7	5,098	159	1,504,244	10,863,412
Chic., Rock Isl. & Pacific.1921	28,641	21,842	50,483	12.1	1,895	1,199	553	25.7	523	29.6	3,447	163	1,311,742	7,765,011
1920	8,254	34,003	42,257	8.9	.....	1,114	520	25.0	569	31.8	3,140	...	1,266,389	8,128,271
Denv. & Rio Grande West.1921	12,532	5,715	18,247	9.9	1,150	1,293	572	26.4	321	19.0	2,262	205	247,153	1,822,284
1920	7,973	7,869	15,842	6.5	.....	1,276	595	27.5	443	24.1	2,695	...	258,574	1,998,363
Oregon Short Line.....1921	7,009	4,913	11,922	3.8	486	1,505	655	27.9	795	46.8	4,018	144	288,883	2,108,210
1920	3,790	7,653	11,443	4.2	.....	1,411	663	28.0	890	48.7	4,319	127	273,015	2,156,094
Southern Pacific 1921	24,598	18,938	43,536	8.1	995	1,591	656	23.3	581	36.2	3,627	147	1,305,182	10,638,606
1920	13,089	32,598	45,687	4.5	.....	1,497	673	24.9	710	38.5	4,651	157	1,457,056	11,881,094
Union Pacific 1921	16,135	11,133	27,268	10.0	1,129	1,651	614	21.7	1,038	75.9	7,830	152	870,687	7,361,024
1920	6,417	18,364	24,781	5.5	.....	1,507	644	23.6	1,439	88.5	9,867	154	923,280	7,725,725
Southwestern Region:														
Gulf, Colo. & Santa Fe..1921	8,073	4,663	12,736	4.9	198	1,423	672	28.0	504	27.1	3,386	134	185,797	1,079,701
1920	2,704	9,031	11,735	7.7	.....	1,347	640	27.2	504	26.5	3,123	...	201,154	1,300,213
Missouri, Kans. & Tex..1921	7,651	5,855	13,506	7.2	1,130	1,504	601	22.6	375	27.2	2,965	134	263,721	1,934,706
1920	4,234	10,031	14,265	7.2	.....	1,379	557	23.7	421	29.7	3,509	...	291,338	2,250,433
Mo., Kans. & Tex. of Tex.1921	277	12,748	13,025	4.9	.....	1,117	469	24.5	279	18.3	2,089	152	258,764	1,573,144
1920	349	12,257	12,606	3.3	.....	1,056	471	25.7	341	20.1	2,474	...	283,690	1,972,850
Missouri Pacific 1921	30,885	23,725	54,610	8.4	1,019	1,344	600	25.2	435	25.4	3,269	154	903,081	5,490,233
1920	10,946	42,348	53,294	4.6	.....	1,343	641	26.9	467	24.3	3,428	...	949,273	5,885,160
St. Louis-San Francisco..1921	20,500	11,094	31,594	6.5	.....	1,024	450	24.7	356	21.5	2,362	181	752,454	4,334,360
1920	8,461	27,101	35,562	5.0	.....	990	438	25.7	385	23.2	2,881	207	771,399	4,734,358
Southern Pacific Lines (in Texas & Louisiana)2...1921	8,477	14,534	23,011	19.8	1,188	1,221	521	25.8	388	23.9	2,444	126	512,141	3,258,041
1920	2,486	20,108	22,594	4.8	.....	1,251	591	27.6	546	28.8	3,385	130	492,994	3,347,902
Texas & Pacific.....1921	5,497	3,996	9,493	26.7	.....	1,239	484	20.5	407	29.1	1,977	143	294,299	1,906,489
1920	1,781	11,781	13,562	7.8	.....	1,193	514	24.3	436	26.7	3,039	142	320,245	2,238,508

[1]Data not available. [2]No passenger-train service.

Compiled by the Bureau of Statistics, Interstate Commerce Commission.

Seven Per Cent of Nation's Workers Engaged in Transportation

The Department of the Census has issued a summary of preliminary occupation statistics for the United States for 1920, which shows 3,066,305 persons in the United States as gainfully occupied in transportation industries or 7.4 per cent of the total persons gainfully occupied, of which 2,852,043 were males, or 8.6 per cent of the males gainfully occupied. The number of females engaged in transportation was 214,262, or 2½ per cent of the gainfully occupied females. The number of females occupied in the various transportation industries had increased 106,596 in 1910.

Reopening of West Albany Shops

The New York Central has leased its repair shops at East Buffalo and at Toledo, as noted last week. No action has been taken toward opening the shops at Collingwood, Ohio.

The company has this week reopened the passenger car shops at West Albany, N. Y., a meeting of 616 employees having voted almost unanimously to accept the proposition of the company to resume work on a piece-work basis. These men evidently are convinced that they will do as well working directly for the company, or better, than if they were to go into the employ of a contractor. The employees have established a committee which is empowered to conduct any necessary negotiations with the superintendent of motive power.

It is understood that the piece-work rates will average about 25 per cent more than was paid, at piece-work rates, for similar work in 1917. These shops have been closed about 10 months.

The Santa Fe's Safety Record

The Safety Department of the Atchison, Topeka & Santa Fe reported on October 31 that 35 men have been killed and 7,109 injured in the various departments of the system during the first nine months of this year. If the monthly average is maintained for the last quarter of this year the total killed will be 47, a marked decrease from the previous year regardless of the reduction in forces of last summer, for during 1920 66 were killed and 9,792 injured. The bulletin, in discussing the figures, says: "Aren't you willing to agree that it would be a wonderful thing if we can keep our 1921 total at not over 40? Is there anything in the world you wouldn't be willing to do to show a net saving of 26 lives under our best previous year? Are you going ahead doing things yourself and seeing your partner doing things you know are against rules and are not to be done, or are you going to stop both?"

Pennsylvania Veterans

The Pennsylvania System Veteran Employees' Association, General Office, Philadelphia, organized in February last, with a membership of 1,335 officers and employees located in the General Office, Philadelphia, who have been in the employ of the road 21 years or more, held its first annual banquet at the Bellevue Stratford Hotel, Philadelphia, on Thursday evening November 17. Among those present were the president, vice-presidents and a large number of other officers of the Pennsylvania System, all of whom are members of the association. There were also representatives from upwards of 50 veteran employees' associations of the various divisions throughout the Pennsylvania system.

Addresses were made by Edward W. Bok, of Philadelphia, Elisha Lee, vice-president of the Pennsylvania, and James C. Rogers, president of the association. Charles Hanson Towne, of New York City, read a poem, written by himself for this occasion.

Long Runs of Passenger Locomotives on the M. K. & T.

What is believed to be the longest regularly assigned run in the United States for steam passenger locomotives was inaugurated by the Missouri, Kansas & Texas on November 6, as a result of 11 months' experience in operating its oil burning locomotives in through runs of 400 miles each between Denison and San Antonio, Tex. Oil fuel having recently been adopted on the line between Denison, Tex., and Farsons, Kan., the plan has been adopted of operating trains No. 5 and No. 6, two of the heaviest on the line, with a single locomotive each way between San Antonio and Parsons, a distance of 678 miles. These trains regularly handle from 10 to 12 cars and frequently are required to handle extra cars. They have been operated on time since the establishment of the long runs. Formerly, the locomotives were changed on these trains at Dennison, Tex., and five locomotives were required to handle the runs. Under these conditions, the locomotives made a daily average of 266 miles each. Under the present plan, three locomotives are required to handle these runs, each making a daily average of 452 miles. Proper care of the locomotives at the terminals is considered the most important factor in insuring the success of the long runs, and in this case each locomotive has a minimum of 12 hours time at each terminal. The locomotives are required to take on fuel only once en route.

Railroad Returns for September

The Interstate Commerce Commission's summary of returns for September for 200 Class I roads is as shown in the table. The Detroit, Toledo & Ironton is not included, its report not having been received.

GROSS AND NET RECEIPTS FOR SEPTEMBER AND NINE MONTHS

	September		Nine months	
	1921	1920	1921	1920
Average number of miles operated	234,938.36	234,685.81	234,818.11	234,220.55
Revenues:				
Freight	$354,052,825	$438,882,228	$2,887,125,811	$3,019,834,654
Passenger	[2]100,679,514	[3]129,857,101	[4]893,592,448	[5]951,907,779
Mail	7,370,281	7,888,630	71,198,953	125,545,910
Express	10,417,319	11,744,382	70,510,865	115,853,552
All other transportation	14,687,655	16,339,330	120,824,477	112,344,672
Incidental	9,952,196	13,734,386	89,597,615	111,526,712
Joint facility—Cr.	639,116	694,843	5,759,157	5,723,553
Joint facility—Dr.	144,053	215,320	1,254,664	1,744,253
Railway operating revenues	497,654,853	618,925,580	4,137,354,662	4,440,992,579
Expenses:				
Maintenance of way and structures	72,556,272	94,571,896	579,275,431	787,432,175
Maintenance of equipment	103,540,033	133,925,264	945,168,064	1,163,804,441
Traffic	6,846,230	6,505,151	63,516,478	52,649,319
Transportation	177,556,916	254,856,925	1,734,737,815	2,102,951,343
Miscellaneous operations	4,030,680	5,452,984	37,601,725	46,191,414
General	13,076,907	14,791,871	127,253,185	127,337,835
Transportation for investment—Cr.	499,221	383,597	4,428,684	3,483,174
Railway operating expenses	377,107,817	509,720,494	3,483,124,014	4,276,883,353
Net revenue from railway operations	120,547,036	109,205,086	654,230,648	164,109,226
Railway tax accruals	26,465,986	24,233,856	209,580,854	206,642,912
Uncollectible railway revenues	92,825	79,050	900,971	833,400
Railway operating income	93,988,225	84,892,180	443,748,823	43,367,086
Equipment rents—Dr. balance	4,689,243	3,494,384	39,372,553	23,369,629
Joint facility rent—Dr. balance	2,124,881	1,722,150	12,991,551	13,892,535
Net railway operating income	87,174,101	79,675,646	391,384,719	80,629,250
Ratio of expenses to revenues (per cent)	75.78	82.36	84.19	96.30

NOTE.—Excludes Detroit, Toledo and Ironton, report not having been filed at date of compilation.

[2]Includes $2,941,179, sleeping and parlor car surcharge.
[3]Includes $2,179,734, sleeping and parlor car surcharge.
[4]Includes $24,694,452, sleeping and parlor car surcharge.
[5]Includes $2,436,898, sleeping and parlor car surcharge.

Commission to Determine Construction of Interlocking Directorate Clause

The Interstate Commerce Commission has announced a hearing at Washington on November 30 as to the construction to be placed on the clause in Paragraph 12 of Section 20-a of the commerce act, which authorizes the commission to permit railroad officers or directors to hold positions with more than one carrier after finding "that neither public nor private interests will be adversely affected thereby." The order for the hearing says that question has arisen regarding the construction of this proviso. The commission has already issued a number of authori-

zations to officers and directors to hold positions with more than one carrier where the other carriers are affiliated or subsidiary companies, but apparently it intends to reach some general decision as to the extent to which interlocking may be not opposed to the public interest.

E. N. Brown is authorized to hold until further order of the commission, the office of chairman and member of the board of directors of the St. Louis-San Francisco, Kansas City, Fort Scott & Memphis, Kansas City, Memphis & Birmingham, chairman and member of the executive committee of the St. Louis-San Francisco and chairman and member of the board of directors and executive committee of the Pere Marquette. Jules S. Bache has been authorized to hold office as officer and director of the Minneapolis & St. Louis; Ann Arbor, Manistique & Lake Superior, and Toledo, St. Louis & Western. Richard Billings is authorized to hold office as president and director of the Woodstock and director of the Boston & Maine. Charles H. Worcester has been authorized to retain his office as director and member of the executive committee of the Minneapolis & St. Louis, president and director of the Ann Arbor and the Manistique & Lake Superior, chairman of board and director of the Middletown & Unionville and director of the Tennessee, Alabama & Georgia. F. A. Chamberlin has been authorized to serve as director of the Minneapolis & St. Louis and president and director of the Minneapolis Eastern; A. F. Banks as president and director of the Elgin, Joliet & Eastern and other roads, and S. M. Rogers as director and vice-president of the Elgin, Joliet & Eastern and other roads. Other officers of the Elgin, Joliet & Eastern have been given similar authority. R. H. Kurrie has been authorized to act as president and director of the Chicago, Indianapolis & Louisville and the Kentucky & Indiana Terminal.

Amendments to Mail Pay Orders

The Interstate Commerce Commission has issued an amendment to its order in the railway mail pay case in response to a petition filed on the joint behalf of the postmaster general and the railroads, in which it prescribes the rate of 40⅝ cents for each mile of service by 70-foot storage car. The amendments are as follows:

It is ordered that there be added to Section 3 the following:

The fair and reasonable rate of payment for transportation of mail matter on and after December 1, 1921, for each mile of service by a 70-foot storage car is 40 5-6 cents. The rules governing service by a 60-foot storage car shall apply to service by a 70-foot storage car.

It is further ordered that the first paragraph of Section 4 be modified to read as follows:

Where authorizations are made for cars or apartments of the standard lengths of 60, 30 and 15 feet, and the railroad company is unable to furnish such cars or apartments of the length authorized, but furnishes cars or apartments of lesser length, but which are accepted by the department to be sufficient for the service payment shall be made only for the actual space furnished and used, the compensation to be not exceeding pro rata of that provided for the standard length authorized. The postmaster-general may accept cars and apartments of greater length than those of the standard requested, but no compensation shall be allowed for such excess lengths except that where an oversize car is furnished storage units may be authorized therein on either the basis of actual measurement or count of sacks and outside packages, whichever may be more practicable, provided that in no case shall payment be made for more than the actual length of the car.

It is further ordered that Section 8 be modified to read as follows:

That during the fiscal year beginning July 1, 1921, and ending June 30, 1922, excepting the month of December, 1921, each carrier shall be paid for all emergency service required and performed on all trains having regular authorizations on each route, except emergency service required and performed in 30-foot and 60-foot authorizations, for which payment shall be made as at present provided, the same amounts each month as accrued on account of 3-foot, 7-foot and 15-foot units of emergency service, storage and closed-pouch, authorized and performed during the month of April, 1921, where the emergency authorizations were less than fifty per cent of the trips, and where the authorizations were for fifty per cent or more of the trips the appropriate higher unit shall be regularly authorized from July 1, 1921.

During the month of April, 1922, and in the same month for each succeeding year during the continuance of this order, a record of the emergency service, storage and closed pouch, actually performed in 3, 7 and 15 foot units on each train of each route shall be kept, and upon the basis of the service so ascertained payment shall be made for each month of the succeeding fiscal year beginning July 1, excepting for the month of December in the same manner as prescribed above for the fiscal year beginning July 1, 1921, both as to payment of emergency service and increases to the higher regular units of service performed.

For the month of December in any year payments shall be made for sixteen days on the basis above prescribed at one-half of the monthly rate as above ascertained and for fifteen days beginning December 17 on the basis of the emergency service actually performed.

By mutual agreement between the postmaster-general and any carrier a different month than April may be selected as the basis for the pay for such emergency service required of and performed by said carrier.

Traffic News

The Phelps Dodge Corporation, New York City, announces the appointment (effective December 1) of F. W. Pullen, as traffic manager in place of G. W. Feakins, resigned.

The National Association of Sand and Gravel Producers has asked the Interstate Commerce Commission to make an expedited investigation into the level of freight rates on sand, gravel and crushed stone between points in the western states.

The Transportation Club of Peoria, Ill., will hold its annual banquet at the Jefferson Hotel, on December 8. The speakers of the evening will be C. H. Markham, president of the Illinois Central and J. H. Beek, executive secretary of the National Industrial Traffic League.

Rates on tin plate from eastern points to the Pacific Coast will be reduced as soon as the tariffs can be published and made effective. The present rates of $1.835 from New York, $1.665 from Pittsburgh, and $1.585 from Cincinnati will be reduced to $1.20 from all points.

Shippers of Toledo, Ohio, have filed a petition with the Ohio Public Utilities Commission attacking industrial switching charges in the Toledo district, claiming that since 1915 the charges have been increased from 16 cents a ton to 42 cents or more than 200 per cent.

The West Coast Lumbermen's Association has applied to the Interstate Commerce Commission for lower freight rates and simplified tariffs, holding that the continued existence of the lumber industry of the North Pacific coast depends upon the ability of the industry to market its products freely.

The New England Homestead, a prominent agricultural newspaper, has sent to the Interstate Commerce Commission a telegram complaining of the reduction of freight rates for Western farmers. It says that New England farmers must pay high rates to get their products to market, while the West and South are subsidized to dump their surplus into New England at 10 per cent less cost. The dispatch says: "The excuse for not reducing rates on produce moving wholly within New England, is that our New England railways are so poor they can't afford it. Why are they so poverty stricken? Partly because for years they have been under an expense of $25,000,000 annually in furnishing Eastern terminal service for Western lines."

Coal Production

Observance of Armistice Day was the principal cause of a sharp drop in coal production during the week ended November 12, according to the weekly bulletin of the Geological Survey. The output of bituminous is estimated at 8,466,000 net tons, as against 9,315,000 tons the week before.

Neosho Plan on Central of Georgia

Seventeen cities along the lines of the Central of Georgia have inaugurated the "Neosho or Golden Rule Sales Plan" of co-operative merchandising and community advertising. For the past two months representatives of the railway have accompanied Gurney R. Lowe, exponent of the plan, in establishing it in different progressive communities. In this plan there is a monthly auction sale of things the farmer wants to sell; and on the same day an offer of genuine bargains by the business houses of the city, on a non-competitive basis; the whole advertised co-operatively; the whole plan working toward a better relation between town and country. Cities adopting the plan are Rome, Carrollton, LaFayette, Newnan, Cuthbert, Americus, Statesboro, Millen, Waynesboro, Tennille, Milledgeville, in Georgia; Opelika, Alexander City, Andalusia, Eufaula, Sylacauga and Florala, in Alabama.

Senators Enter a Rate Controversy

A protest, signed by 11 United States senators from the Middle West, against the alleged refusal of the eastern and western railways system to follow up their reduction of export rates on steel and steel products to North Atlantic ports by concurring in similar reductions to southern ports has been filed with the Interstate Commerce Commission. The petition was made in behalf of Middle Western shippers, and was signed by Senators McKinley and McCormick of Illinois, Willis of Ohio, Spencer and Reed of Missouri, Kenyon of Iowa, Townsend of Michigan, New and Watson of Indiana, and Capper and Curtis of Kansas.

In addition to protesting against the action of the roads in refusing to grant the same reduction to Gulf and south Atlantic ports, the petition also directs the attention of the commission to a reported plan of the roads to include other commodities in the "preferential" reductions, "thereby further injuring the shippers in the territory referred to." The action by the railways, the petition says, constitutes a grave menace to the commercial interests of the entire Middle West "that can only serve to cripple the expansion of the foreign trade of the United States." The commission is asked "to lend the full measure of its protection" to prevent the roads from carrying their program into effect.

Rate Hearings Begin at Chicago

The transcontinental rate hearings opened at Chicago before Examiner Disque of the Interstate Commerce Commission, on November 17. Edward Chambers, vice-president in charge of traffic of the Atchison, Topeka & Santa Fe, was the first witness for the carriers and made a general statement of the history of transcontinental rates which is printed elsewhere in this issue. Mr. Chambers, on the completion of his statement, was cross-examined by attorneys for both sides. He held, under examination, that users of water routes should help bear the burden of up-keep of those routes of travel and stated that if Congress removed the Panama Canal toll, it would fost certainly lead to another application for a hearing by the transcontinental carriers, providing that the boat lines passed the reduction on to the shippers. As Mr. Chambers left the stand he was asked by the examiner what the transcontinental carriers proposed to do in case the commission denied their application, and answered, that such a possibility had not been considered. Paul P. Hastings, member of the standing rate committee of the Transcontinental Freight Bureau, followed Mr. Chambers on the stand, and presented exhibits in support of the carriers' stand. In all cases, he said, the transcontinental carriers rates were somewhat higher than the port-to-port water rate plus the rail haul to the port and the switching movement, drayage, etc., to compensate the carriers for superiority in service. On the morning of the second day, Mr. Hastings discussed in detail each of the 80 items contained in Countiss' application No. 19. He presented his discussion with material showing the principal producing points, rail rates from those points to the Atlantic and Gulf ports and the water rates beyond to the Pacific coast. These rates were also shown to be above the rail and water rates. In some cases, however, as with canned goods from Pittsburgh and west, it was shown to be less. Mr. Hastings said that if the application before the commission seeking proportional rates from western trunk lines and southern territory to the Gulf ports should be granted, the transcontinental carriers would ask for a suspension.

Examiner Disque on November 15, took testimony for and against the fourth section application of the Transcontinental Freight Bureau. The first hearing was on the re-opened fourth section application, No. 8835, involving rates on sugar from California to Chicago, St. Louis and the Missouri river, in which the commission granted permission to the transcontinental carriers to disregard the fourth section of the act. J. F. Abbott, appeared as attorney for the applicants and T. J. Norton as counsel for the transcontinental carriers. Little was accomplished at the hearing and the way now points to the New Orleans, La., hearing which will be held later.

ONE HUNDRED AND FIFTY ADDITIONAL MEN are to be added to the New York Central locomotive shop forces at West Albany, N. Y., this increase in force to take place as fast as competent men can be obtained.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has rendered a decision in the complaint of the Arizona and other state commissions in which it finds that the passenger fares between points in Arizona, Nevada and New Mexico and between those points and points in other states are not unreasonable, unjustly discriminatory or unduly prejudicial.

The Interstate Commerce Commission has rendered a decision in part 2 of the case involving rates to, from and between points south of the Ohio river, including the Mississippi valley. Part 1 of this case related to class rates and part 2 to commodity rates. The proposed revision of commodity rates designed to eliminate deviations from the long and short haul provision of the fourth section in the construction of rates primarily affecting Mississippi valley points and Nashville, Tenn., is found not justified except as indicated more particularly in the decision. The railroads are required to cancel the suspended schedules in so far as they are found not justified and to file new schedules establishing rates in accordance with maximum bases prescribed in the opinion. The proceeding is discontinued. The commission has also modified its order in this case of October 10 to make the rates therein ordered effective on January 15, 1922, instead of January 1.

State Commissions

The Illinois Commerce Commission completed hearings, November 19, on objections to the increase which became effective a short time ago in express rates on certain commodities, and granted leave to the American Railway Express Company to file an answer to the objections within 30 days.

The Public Service Commission of Alabama has received from the railroads their proposals for a general revision of freight rates in Alabama; and has set December 12 as the date on which testimony will be heard in support of the proposals. The main purpose of these new tariffs is to secure uniformity of bases as between different states and as between intrastate rates and interstate. It was stated in behalf of the railroads in the presentation of the tariffs that probably the new rates would make no material addition to the revenue of the carriers as a whole.

Court News

Cattle Guard Statute—Injury to Cattle

The Idaho statute (Comp. St. 1919, § 4815) makes it the duty of railroad companies to maintain a cattle guard only where the railroad crosses a public highway or public traveled road. In an action for damages to live stock, alleging violation of the statute, the Idaho Supreme Court holds that it is not sufficient to prove that the railroad did not maintain such a cattle guard. In addition to that, it must be shown that because of such failure the cattle got on the track.—Bliss v. Oregon Short Line (Idaho) 200 Pac. 721.

Contributory Negligence at Crossing Not Excused by Speed Ordinance

The Missouri Supreme Court holds that an automobilist who could have seen an approaching train for half a mile, had he looked, when 50 feet from a familiar crossing in a city, but did not look, after passing all obstructions to his view, until about 12 or 15 feet from the crossing, was guilty of contributory negligence, barring recovery, when struck by the train. He was not excused from looking or listening or entitled to rely on the presumption that the speed of the train would be reduced from 30 to the ordinance limit of 12 miles an hour as it approached the crossing.—Alexander v. St. Louis-San Francisco (Mo.) 233 S. W. 44.

Foreign Railway News

Australian Railways Show Deficit

The annual report of the government railways of South Australia for the fiscal year ended June 31, 1921, shows a deficit of $2,733,550 (£ to $ at par). This loss was due to increased costs—primarily wages—which increased rates were not sufficient to cover. The lines total 2,333 miles, of which some 1,209 miles are of 3 ft. 6 in. gage and 1,124 of 5 ft. 3 in. gage. The New South Wales Railways for the same period showed a deficit of $2,200,653. The mileage of these lines is 5,043.

Northwestern of Peru Taken Over by Government

By executive decree of August 31 the Peruvian Government will acquire the control and administration of the Northwestern Railway of Peru, the main line of which connects the towns of Ancon and Huacho—a distance of about 90 miles, according to Commerce Reports. The sum involved in the transaction is said to be approximately $3,500,000. Two other short branches of the road run from Huacho to Sayan and from Huaral to Chancay—distances of 34 and 8 miles respectively. The road is now owned by a British company.

German Rail Employees Object to Private Operation

The activities of Hugo Stinnes, the German industrial magnate, which have been directed toward bringing the control of the government railways into his hands, are objected to strongly by the German railway unions, according to the New York Evening Post. Stinnes promises to do away with thousands of superfluous employees if the railways are entrusted to him, abolish the eight-hour day and reduce wages so the railways will be operated at a profit. The unions have served notice on the minister of railways that such a change will not be permitted and that the Socialist party, which is in control in the Reichstag, will not sanction it.

Gas to Be Abolished on French Trains

LONDON.

M. le Trocquer, Minister of Public Works of France, has sent a circular letter to all railway companies instructing them to take immediate steps to abolish the use of gas in the lighting of trains. Gas lighting, he says, must be abolished on all express trains by January 1, 1923, and on all suburban trains by January 1, 1924. Returns are to be called for from railway companies showing from time to time how far the transformation of the lighting system has progressed. Coal fires for the heating of trains are to be done away with within a period of two years. The letter concludes by asserting that the directors of the companies will be held personally responsible in the event of accidents in any way attributable to neglect of this admonition. This is a sequel to the Batignolles tunnel accident, in which several coaches of a train caught fire and many persons were killed.

Improvement in Service on Italian Railways

Passenger-train service on the Italian State Railways is to be greatly improved, according to Commercial Attaché MacLean, Rome. Beginning with November, the railway administration announced marked improvement in the running time of trains between Rome and other principal cities of Italy. The number of trains has been increased and schedules have been adopted which will eliminate delay in making connections. Beginning October 26, communication between Rome and Berlin was shortened by six hours, two trains following the Bologna-Brenner route and covering the distance in 40 hours, instead of 46 as heretofore.

To stimulate passenger traffic, the railways have instituted the sale of a document authorizing the purchase of tickets at half price on special groups of railway lines and also on steamship lines managed by the railways. These tickets are valid for three, six, or twelve months and for journeys not exceeding 62 miles; also for journeys having no fixed limits, at special rates. Tickets are issued to two members of one firm at an increased cost of one-third.

Operating Results of French Railways for 1920

LONDON.

The 1920 operating results of the six important railway systems in France, namely: the Nord; Est; Paris, Lyons & Mediterranean; Paris-Orleans; Midi, and Etat, have recently been made public. They show a very disastrous deficit, the average operating ratio for the entire six roads being 135 per cent, that for the State Railway being 153 per cent, which is the largest of the six.

The ratio of charges on capital to expenses for this period was 12 per cent. For the year 1920 the gross deficit resulting from operation and charges on capital for all six roads amounted to 3,007,500,000 francs, which at a normal rate of exchange is $601,300,000. For the seven years, 1914 to 1920, inclusive, the total gross deficit amounts to 5,574,400,000 francs, or $1,114,880,000, there having been a loss during each year of that period.

The following table shows the relative increases in numerous items of expense for the year 1920 as compared with the year 1913:

Increase in number of operative locomotives	5.8 per cent
Increase in power of operative locomotives	17.5 per cent
Increase in number of freight cars	15.5 per cent
Increase in capacity of freight cars	22 per cent
Increase in operating ratio	116 per cent
Increase in traffic receipts*	167 per cent
Increase in passenger receipts	106 per cent
Increase in operating expenses	470 per cent
Increase in cost of wages	340 per cent
Increase in number of employees	40 per cent

*This does not include receipts from the handling of war traffic.

In commenting on the results as disclosed by this return, the Revue Generale des Chemins de Fer et des Tramways says in part:

"The financial situation of the railways is serious. What will happen to them in the future? Are we justified, under present conditions, in anticipating an early increase of receipts or a reduction of expenses?

"As regards the (1920) receipts, these were affected very severely by the strike in the month of May, and later, in the last months of 1920, by the falling off in traffic which was the natural consequence of the decreased industrial and commercial activity of the country. Some day this situation must improve and then a considerable increase in receipts may be looked for. But when will this be? No one can tell, and it would be rash to prophesy at a time when there is no sign of recovery.

"It appears, however, that a decrease in costs may be expected from the alterations in the mode of applying the eight-hours act, which the railways, in agreement with the Minister of Public Works and in conformity with the wish lately expressed by the Finance Commission of the Senate, have decided to make.

"Taking everything into account, it seems clear that the chance of a reduction in expenditure is greater than the chance of an increase. But this improvement in the financial situation of the railways can only be pursued and obtained on one condition, namely, that the credit which the companies now enjoy is maintained and consolidated and that nothing should be done to injure it.

"This credit remained intact during the whole period of the war and continues to be excellent in spite of the deficit burdening the railways. It is indispensable to the state, since the companies borrow partly on its account, and it will in future be all the more necessary to the companies on account of the fact that they will have to have recourse to numerous emissions of shares in order to improve and strengthen their plant and undertake the electrification of their lines. Any measure which would weaken the credit of the companies, increasing their burdens, would have a disastrous effect on their financial condition.

"Now this credit cannot be maintained in its present favorable situation and cannot be improved except by passing promptly the bill for the reorganization of the railways, at present before parliament. This bill, by settling the difficulties created by the war and putting an end to the temporary system under which the railways are at present being operated, gives the companies security for the future, and by that fact alone strengthens their credit. This bill will give confidence to capitalists and enable the companies to obtain the enormous capital they will require in order to meet the demands of traffic in the future."

Equipment and Supplies

Locomotives

THE COPPER RIVER & NORTHWESTERN is inquiring for 5 Mikado type locomotives.

THE GREEN BRIAR & EASTERN has ordered 1 Mikado type locomotive from the Baldwin Locomotive Works.

THE TAIWAN ELECTRIC POWER COMPANY is inquiring through Mitsui & Company, New York, for 2 light locomotives.

THE PITTSBURGH PLATE GLASS COMPANY, Zanesville, Ohio, has ordered from the American Locomotive Company, 1, 4-wheel switching locomotive. This locomotive will have 13 by 20 in. cylinders, and a total weight in working order of 65,000 lbs.

The MEXICAN PETROLEUM COMPANY, 120 Broadway, New York, has ordered from the American Locomotive Company, 1, 4-wheel switching locomotive. This locomotive will have 14 by 22 in. cylinders, and a total weight in working order of 79,000 lbs.

Freight Cars

THE MISSOURI PACIFIC is inquiring for the repair of 1,000, 30-ton box cars.

The GREAT NORTHERN is inquiring for 500, 50-ton composite cars and 1,000, 40-ft. stock cars.

THE BELT RAILWAY COMPANY, Chicago, is inquiring for repairs on 300 National dump cars.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY is inquiring for 100 refrigerator car steel underframes.

THE CHICAGO GREAT WESTERN is inquiring for repairs on 100 refrigerator cars and 150 National dump cars.

THE CHICAGO & ALTON has awarded a contract for the repair of 150 gondola cars to the Streets Company, Chicago.

The CHICAGO, BURLINGTON & QUINCY inquiries call for 2,500 box cars, 3,000 general service, 500 stock, and 1,300 refrigerator cars.

The LIVE POULTRY TRANSIT COMPANY, Chicago, has given a contract for 100 poultry cars to the American Car & Foundry Company.

THE CHICAGO, BURLINGTON & QUINCY has awarded a contract for the repair of 300 50-ton gondola cars to the General American Car Company, Chicago.

THE DELAWARE, LACKAWANNA & WESTERN, reported in the *Railway Age* of October 29 as inquiring for 500 box cars has ordered this equipment from the American Car & Foundry Company.

Passenger Cars

The GREAT NORTHERN is inquiring for 35 passenger cars.

THE CHICAGO & NORTHWESTERN is inquiring for 9 baggage cars, 5 combination baggage and mail, 20 coaches and 10 smoking cars.

THE CHICAGO, BURLINGTON & QUINCY inquiries call for 54 passenger cars, 5 chair, 12 baggage, 22 mail, 19 mail and baggage and 12 dining cars.

Iron and Steel

MITSUI & COMPANY, New York, are inquiring for 900 tons of 16-lb. rail, also for 1,200 tons of 60-lb. rail and another lot of 700 tons of 60-lb. rail, all for export to Japan.

Supply Trade News

The **F. C. Richmond Machinery Company,** 117 West Second street, Salt Lake City, Utah, has been appointed representative of the **Orton & Steinbrenner Company,** Chicago.

F. T. Coup in charge of the Milwaukee, Wis., office of the **Wagner Electric Manufacturing Company,** St. Louis, Mo., has been appointed district manager, in charge of its Cincinnati, Ohio, office, 20 East Ninth street.

The **Combustion Engineering Corporation,** New York, recently opened two branch offices, one at 216 Latta Arcade, Charlotte, N. C., in charge of **T. E. Nott** and the other at Seattle, Wash., where the company is represented by the **Fryer-Barker Company,** 1133 Henry building.

Manning, Maxwell & Moore, Inc., New York, will remove its Philadelphia, Pa., office during November from the Lincoln building, to larger quarters in the Pennsylvania building at Fifteenth and Chestnut streets. The company will also remove its Boston, Mass., office about December 1 from 10 High street to the Textile building, 99 Chauncey street.

Pullman and Haskell & Barker Merger

Stockholders of the Pullman Company will hold a special meeting in Chicago on December 20, to vote on the following amendments to the charter of the company:

Increasing the capital stock from $120,000,000 to $135,000,000 and increasing the number of directors from nine to twelve and electing the same. To authorize directors to purchase all assets of the Haskell & Barker Car Company, Inc., and pay therefor $275,000 in cash and 165,000 shares of the capital stock of the Pullman Company, and in case of adoption of the amendment increasing capital stock, authorize the board to issue and deliver direct to the Haskell & Barker Company 150,000 shares of the increase.

The $275,000 cash payment is equal to $1.25 a share on the Haskell & Barker stock, which, it is expected, will be distributed as an extra dividend.

Trade Publications

HIGH SPEED METAL SAWS.—The Peerless Machine Company, Racine, Wis., has recently issued a circular containing a complete revision of list prices of its line of high speed metal saws. These prices mark a return to the 1918 basis.

AIR LIFTS.—The Sullivan Machinery Company has issued bulletin No. 71-G describing air lift pumping systems manufactured by that company. This is a revision and explanation of the previous bulletin covering the same subject. In addition to describing air lift pumping equipment, the bulletin gives extensive tables relating to hydraulic constants, pipes, and other mathematical information of value in connection with the solution of hydraulic problems.

RADIAL WALL DRILL.—The Pawling & Harnischfeger Company, Milwaukee, Wis., has recently issued Bulletin No. 206, describing its No. 6 radial wall drill which has been designed to meet the demand for a simple and effective machine for drilling, reaming and countersinking large unwieldy pieces. Examples of interior and exterior drilling of large steel drums and the drilling and reaming of structural material are shown in the bulletin, also dimension drawings.

RAILROAD TAXES in New Jersey are this year so high that the principal railroad companies have filed with the State Board of Taxes and Assessment, formal objections to the valuations of the board upon first and second class property. The assessment, as established by the board is $415,773,910, which the roads say, is excessive. The board will give a hearing, but not before December 15. The assessment of $415,773,910 is an increase of $25,544,-

Railway Construction

ALASKA RAILWAY COMPANY.—This company has applied to the Interstate Commerce Commission for permission to issue 2,500 shares of stock to provide funds for the extension of its main line from the present terminus.

AMERICAN RAILWAY EXPRESS.—This company will construct a one-story express building, 21 ft. by 100 ft., costing approximately $25,000 at Lima, Ohio.

ATCHISON, TOPEKA & SANTA FE.—This company will construct a coal chute at Amarillo, Tex.

CANADIAN PACIFIC.—This company has awarded a contract to Anglin-Norcross, Ltd., Quebec, for the construction of a 17-story addition to the Chateau Frontenac, its hotel at Quebec. The structure will be of brick, stone and steel—fireproof construction—and will cost in the neighborhood of $3,500,000.

CHICAGO, OTTAWA & PEORIA.—This company, in conjunction with the Chicago, Rock Island & Pacific, LaSalle county and the state of Illinois, contemplates the construction of a viaduct over its tracks and those of the Rock Island at Moriarity Hill, near Ottawa, Ill.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has awarded a contract to T. S. Leake & Company, Chicago, for the construction of a mill building at Pratt, Kan.

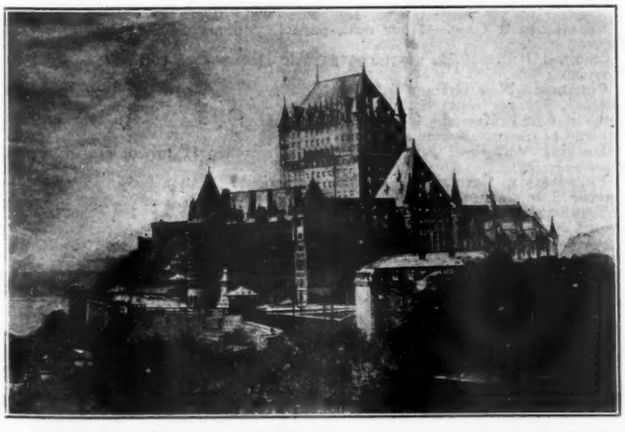
CHICAGO UNION STATION CO.—This company is accepting bids for four water tube boilers to be installed in its boiler house at Chicago, two boilers to have not less than 6,000 sq. ft. of heating surface and the remaining two not less than 3,000 sq. ft.

ILLINOIS CENTRAL.—This company received bids on November 17, for the construction of a freight house at West Frankfort, Ill., to cost about $50,000.

ILLINOIS CENTRAL.—This company is receiving bids for the construction of a frame storehouse at Clinton, Ill.

MISSOURI PACIFIC.— This company has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the construction of a pumping station and water treating plant at Fort Scott, Kan.

YUCCA—BOULDER CANYON LINE.—The construction of an electric railway from a point on the Atchison, Topeka & Santa Fe Coast Lines, near Yucca, Ariz., north to Boulder Canyon on the Colorado river, via Oatman, Ariz., and Katherine, is contemplated. G. P. Mohler of Needles, Cal., is interested in the project.



The Chateau Frontenac, the C. P. R. Hotel at Quebec, As It Will Look When Addition Noted Above Is Completed

Railway Financial News

BALTIMORE & OHIO.—*Annual Report.*—The corporate income account for the year ended December 31, 1920, compares with the previous years as follows:

	1920	1919
Railway operating income (September 1 to December 31)	$6,977,754	.....
Compensation accrued for federal control period (January and February, 1920; year 1919)	4,803,697	$28,031,147
Guaranty (March 1-August 31)	15,189,722	.....
Total other corporate income	5,399,859	5,221,419
Gross corporate income	31,834,154	32,266,717
Interest on funded debt	21,960,591	19,640,622
Total deductions from gross corporate income	24,588,673	23,686,695
Net corporate income	7,245,481	8,580,022
Income applied in redemption of funded debt	3,500,000	.....
Income appropriated for additions and betterments	.....	1,750,000
Dividends on preferred stock (4 per cent per annum)	2,354,531	2,354,531

CENTRAL OF NEW JERSEY.—*Sells Coal Stock for* $32,500,000.—This company has sold its 169,788 shares of Lehigh & Wilkes-Barre Coal Company stock to a syndicate among whose members are a number of minority stockholders of the coal company, some independent coal interest, and the Burns Brothers interests. The syndicate manager is Jackson E. Reynolds, vice-president of the First National Bank, who is a director of the coal company and has been identified with it for 20 years.

The total consideration to be received by the seller is, in round figures, $32,500,000. The dates of payment of the instalments are December 6, 1921, July 1, August 1, September 1 and October 1, 1922. The first payment will be about $10,000,000.

The sale of the Lehigh & Wilkes-Barre coal stock was in accordance with the United States Supreme Court decree of April 6, 1920. This decree dissolved the combination of the Reading Company, the Philadelphia & Reading Railway, the Philadelphia & Reading Coal Company, the Central Railroad of New Jersey and the Lehigh & Wilkes-Barre Coal Company.

CHESAPEAKE & OHIO.—*Dividends Resumed.*—This company has declared a dividend of 2 per cent., payable January 3 to stock of record December 2. This is the first payment made since December 31, 1920. From 1917 to 1920 the road's regular rate was 4 per cent annually, but on May 20, 1921, the company deferred action on the regular 2 per cent semi-annual dividend, due June 30.

CHICAGO & EASTERN ILLINOIS.—*Reorganization Plan Operative.*—Kuhn, Loeb & Co., reorganization managers, have given notice that the plan and agreement for the reorganization of the Chicago & Eastern Illinois, dated March 31, 1921, are now operative. The details of the reorganization plan were given in the *Railway Age* of April 8, 1921, page 913.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—*Dividends Declared.*—This company has declared a regular quarterly dividend of 1¼ per cent on the preferred stock, payable December 1 to stock of record November 22. A semi-annual dividend of 3 per cent and an extra dividend of 3½ per cent were declared on the common stock, payable December 27 to stock of record December 6. This extra dividend compares with 2½ per cent paid last June.

Annual Report.—The income account for the year ended December 31, 1920, compares with the previous year as follows:

	1920	1919
Operating revenues (March 1-December 31)	$17,580,902	.....
Operating expenses (March 1-December 31)	13,935,513	.....
Net revenue from operations	3,645,389	.....
Taxes	519,487	.....
Operating income (March 1-December 31)	3,822,225	.....
Standard return (January and February, 1920; year 1919)	590,173	$3,541,040
Total non-operating income	134,359	110,043
Gross income	4,546,757	3,651,082
Deduct—rent for leased roads	1,218,954	1,214,751
Interest on equipment obligations	175,040	140,413
Total deductions from gross income	1,818,122	1,649,616
Dividends:		
5 per cent on preferred stock	122,670	122,670
13 per cent on common stock	388,700	388,700
Balance carried to credit of profit and loss	1,267,265	890,096

The revenues and expenses in detail and the principal traffic statistics for 1920 compare with 1919 as follows:

	1920	1919
Operating Revenues		
Freight	$15,347,954	$11,871,984
Passenger	4,369,250	3,598,768
Total operating revenues	$21,118,821	$16,313,686
Operating Expenses		
Maintenance of way and structures	$2,406,504	$2,610,342
Maintenance of equipment	5,699,341	5,188,286
Traffic	361.039	275,589
Transportation	7,893,040	6,922,979
General	490,794	413,699
	$16,993,255	$15,499,095
Net revenue from operations	4,125,566	814,591
Taxes	595.559	652,310
Total operating income	3,527,855	155,596
Miles of road operated	338	336
Passenger Traffic		
Number of passengers carried	1,762,132	1,635,023
Number of passengers carried one mile	149,359,030	132,047,224
Average distance hauled per passenger (miles)	84.76	80.76
Average receipts per passenger per mile (cents)	2.93	2.73
Freight Traffic		
Number of revenue tons carried	6,695,999	4,682,999
Number of tons carried one mile	1,425,608,322	1,094,293,911
Average distance hauled per ton (miles)	212.90	233.67
Average receipts per ton per mile (cents)	1.08	1.09

DENVER & RIO GRANDE.—*Stockholders' Suit for* $200,000,000.—The stockholders' protective committee has caused to be served on former directors and officials of the company summons in a suit in the Supreme Court of New York to recover $200,000,000 for alleged losses to the stockholders growing out of misfortunes of the road extending over a period of five years and ending in the sale of the property to satisfy a judgment. The defendants named are George J. Gould, Edward T. Jeffery, Arthur Coppell, Edwin Gould, Kingdon Gould, Edgar L. Marston, Benjamin F. Bush, Edward L. Brown, Edward D. Adams, Finley J. Shepard, Harrison Williams, Benjamin B. McAlpin, George G. Haven, Henry U. Mudge, James Horace Harding, Harry Bronner, Charles C. Huitt, John H. McClement, Alvin W. Krech, Alexander R. Baldwin and the Denver & Rio Grande Railroad Company.

The complaint among other things specifically charges the following:

> That in February, 1915, the defendants entered into a conspiracy to wreck the Denver & Rio Grande, and to cause all its properties to be wiped out and absorbed by adverse interests. That as an initial step the conspirators caused and permitted a default to be made in the interest payable March 1, 1915, on Western Pacific first mortgage, and although the Denver had ample cash and other resources to protect Western Pacific against such foreclosure they interposed an answer on the same day as suit for foreclosure was filed, admitting all the allegations of the bill.
>
> Judgment demanded in the complaint is as follows:
>
> (1) That the defendant and each of them be required to account for and to make restitution of all the moneys, properties and funds of the Denver & Rio Grande Railroad Company, of which the Denver & Rio Grande Railroad Company has been wrongfully and unlawfully disseized and divested, and for all loss and damages which the Denver & Rio Grande Railroad Company and its stockholders have sustained in the premises, aggregating $200,000,000; and that the defendants be adjudged to account for and to pay to the defendant, the Denver & Rio Grande Railroad Company, or to these plaintiffs for the use of the Denver & Rio Grande Railroad Company the amount of said loss and damages.
>
> (2) That the plaintiffs have such other and further relief as may be agreeable to equity and good conscience, besides the costs and disbursements of this action.
>
> The complaint was prepared by Arthur M. Wickwire and Daniel W. Blumenthal, counsel for the protective committee.

Alvin W. Krech, president of the Equitable Trust Company, who is named as one of the defendants in the action, brought by the stockholders, made the following statement:

> So far as concerned the claim that I conspired with the directors of the Denver Company or the directors of the old Western Pacific Company to cause those companies or either of them to default in the performance of their obligations, or to accomplish anything else to the detriment of those companies, there is not only no foundation for the statement, but the circumstances under which it has been made are such that I have no doubt whatever that its falsity is known to the attorneys filing this suit. Most of the matters set forth in the complaint have been before the courts in various proceedings. The entire claim so far as I am concerned is predicated on the theory that obligations assumed by the Denver and the old Western Pacific Conmpany were not valid. As a matter of fact the validity of these obligations has been established and finally determined by the federal courts of this circuit, of the ninth circuit and of the eighth circuit.

EDMONTON, DUNVEGAN & BRITISH COLUMBIA.—*New Director.*—Vernon W. Smith, minister of railways for the province of Alberta, was, on November 22, elected a director. Mr. Smith succeeds Charles Stewart, former premier of Alberta, who resigned from the directorate when his party was defeated in the provincial election.

HOCKING VALLEY.—*Dividends Resumed.*—This company has declared a dividend of 2 per cent, payable December 31 to stock of record December 9. Although not declared as for a stated period, this dividend corresponds to the dividend which had been declared semi-annually before last June, when the usual declaration was omitted.

LIVE OAK, PERRY & GULF.—*Authorized to Abandon Line.*—This company has been authorized by the Interstate Commerce Commission to abandon a branch of its line 2 miles long in Taylor County, Fla.

MISSOURI, KANSAS & TEXAS.—*Reorganization Plan.*— See article on another page of this issue entitled "M. K. & T. Reorganization Plan Announced."

Payments to Railroads

Payments by the Treasury to railroads on account of federal control and the Transportation Act of 1920 from July 1 to October 31, 1921, amounted to $37,949,751, as compared with $264,040,418 in the corresponding period of 1920, according to a statement issued by the Treasury Department.

Tentative Valuations

The Interstate Commerce Commission has issued a number of additional tentative valuations. It finds that as of 1916 the final value of the property used by the East Jersey Railroad & Terminal Company was $475,890 and the owned property $359,390. For the Paris & Mt. Pleasant the commission found a final value as of 1918 of $813,771. For the Rock Island Frisco Terminal, 1915, the final value of owned property was given as $2,035,988 and of the used property $2,089,674. For the Pickens Railroad as of 1916, the commission found a final value of $126,426 and of the Virginia Southern as of 1916 a final value of $127,551.

The tentative valuation of the Chicago, Indianapolis & Louisville as of 1915 gives a final value of the owned property, 509 miles, of $27,272,707 and of the used property, 583 miles, which includes 64.8 miles of the Indianapolis & Louisville and 9.4 miles of the Indiana Stone Railroad, a final value of $31,495,358. The stock of the leased lines is owned by the Chicago, Indianapolis & Louisville. Its outstanding capitalization as of the valuation date was $33,710,930. The investment in road and equipment as stated in the carrier's books was $37,225,989, but the commission says that if certain readjustments were made this would be reduced to $36,424,870, of which $27,453,353 represents the par value of securities issued or assumed. The cost of reproduction less depreciation of the owned property was placed at $22,938,569 and of the used property at $25,393,900. The company also owned securities of non-carrier companies of a par value of $5,832,353 and a book value of $4,013,296.

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly, payable December 31 to holders of record December 1.

Chesapeake & Ohio.—2 per cent, payable January 3 to holders of record December 2.

Chestnut Hill.—$0.75, quarterly, payable December 5 to holders of record November 20.

Cincinnati, New Orleans & Texas Pacific.—Common, 3 per cent; common (extra), 3½ per cent; both payable December 27 to holders of record December 6. Preferred, 1¼ per cent, quarterly, payable December 1 to holders of record November 22.

Hocking Valley.—2 per cent, payable December 31 to holders of record December 9.

Philadelphia, Germantown & Norristown.—$1.50, quarterly, payable December 5 to holders of record November 20.

Tuckerton Railroad.—(Special), $1, payable December 1 to holders of record November 19.

ON JULY 31, 1921, the Interstate Commerce Commission had 1,919 employees under the classified civil service; the Railroad Administration had 1,327 and the Labor Board had 76.

ASBESTOS ROCK to the amount of 3,123,370 tons was mined in the province of Quebec during 1920, according to the annual report of the Department of Mines. From this quantity 170,500 tons of merchantable fiber was secured. Of this amount only 1,026 tons were rated as Crude No. 1, but this class alone was valued at $1,513,439. The total value of asbestos products was $14,749,048.

Railway Officers

Executive

Edward W. Mason, general manager of the Western Pacific, has been elected vice-president and general manager in charge of operation and maintenance. **Charles Elsey,** treasurer of the company, has been elected vice-president and treasurer in charge of finance, accounting, real estate and insurance.

D. W. Pontius, general manager of the San Diego & Arizona, with headquarters at San Diego, Cal., has been elected vice-president and general manager of the Pacific Electric, a subsidiary of the Southern Pacific, with headquarters at Los Angeles, Cal., to succeed H. B. Titcomb, who has been elected president of the Southern Pacific of Mexico and the Arizona Eastern, as noted in the *Railway Age* of September 24 (page 600). Mr. Pontius has been connected with the Southern Pacific for about thirty years, filling successively the positions of telegraph operator, station agent, trainmaster and district freight and passenger agent. From 1908 until February 1, 1911, he was traffic manager of the Los Angeles Pacific Railway, and then, with the consolidation of the seven electric lines in southern California to form the Pacific Electric, he became traffic manager of the latter company. In December, 1917, he was elected general manager of the San Diego & Arizona, which position he was holding at the time of his recent appointment.

Financial, Legal and Accounting

F. M. Angellotti has been appointed general counsel of the Western Pacific, succeeding **A. R. Baldwin,** who has been elected president of the Western Pacific Railroad Corporation. **W. G. Bruen** has been appointed secretary, succeeding Charles Elsey, who has been elected vice-president.

Operating

A. W. Thompson has been appointed car accountant of the Louisville & Nashville, with headquarters at Louisville, Ky., succeeding Edward L. Hill, whose death was noted in the *Railway Age* of October 29 (page 858).

A. T. Mercier, superintendent of the Portland division of the Southern Pacific, with headquarters at Portland, Ore., has been appointed general manager of the San Diego & Arizona, with headquarters at San Diego, Cal.

B. B. Hickman, general agent, freight department, of the Terminal Railroad Association of St. Louis and the St. Louis Merchants Bridge Terminal Railway, has been promoted to general superintendent of the latter company, succeeding J. A. Mathewson, promoted.

C. H. Buford, superintendent of the Sioux City and Dakota division of the Chicago, Milwaukee & St. Paul, with headquarters at Sioux City, Iowa, has been transferred to the Terre Haute division (formerly the Chicago, Terre Haute & Southeastern Railway), with headquarters at Terre Haute, Ind., succeeding **M. J. Griffin,** who has been appointed assistant superintendent of that division. **E. F. Rummel,** assistant superintendent of the Chicago Terminal division, will succeed Mr. Buford, and will be succeeded by **N. A. Meyer,** who is at present assistant superintendent of transportation of lines east of Mobridge, S. D.

C. F. Donnatin, whose promotion to superintendent of the San Joaquin division of the Southern Pacific, with headquarters at Bakersfield, Cal., was announced in the *Railway Age* of October 15 (page 743), first entered the service of that road as a call boy and was soon promoted to station agent and telegrapher. From that position he was transferred to the construction department as a brakeman. After working in that department for some time, he was transferred to the operating department, and was later promoted to conductor. Since that time he has been promoted successively to yardmaster, trainmaster, and assistant superintendent of the Los Angeles division, with headquarters at Los Angeles, Cal., which position he was holding at the time of his recent promotion.

John A. Mathewson, whose appointment as general manager of the Terminal Railroad Association of St. Louis, was announced in the *Railway Age* of November 19 (page 1018), was born in 1866 at Sardinia, New York. He entered railroad service at the age of 15, in the machine shops of the Grand Rapids & Indiana. His next railroad position was with the Northern Pacific, for which road he worked as a switchman, and he held the same position at different times for various other roads, including the Michigan Central, the Grand Trunk and the Chicago, Rock Island & Pacific. He entered the service of the Terminal Railroad Association of St. Louis, 26 years ago as a switchman, and was promoted successively to yardmaster, trainmaster and, in 1918, to superintendent of the St. Louis Merchants Bridge Terminal Railway, a subsidiary company, which position he was holding at the time of his recent promotion.

Mechanical

G. W. Lillie nas been appointed superintendent of motive power of the Denver & Salt Lake, effective October 16, succeeding M. B. McPartland, resigned to enter the service of another railroad company.

G. E. Passage, assistant division master mechanic of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., has been promoted to master mechanic of the Terre Haute division, with headquarters at Terre Haute, Ind., succeeding J. A. Richards, who has been assigned to other duties.

Engineering, Maintenance of Way and Signaling

William Gerig, assistant chief engineer of the Alaskan Engineering Commission, has resigned to engage in private engineering practice.

George H. Harris, whose appointment as assistant chief engineer of the Michigan Central, with headquarters at Detroit, Mich., was announced in the *Railway Age* of November 19 (page 1018), was born at Toledo, Ohio, on July 17, 1878. Upon leaving the University of Michigan in 1902, he entered the employ of the Pennsylvania on its Chicago Terminal division. He left that road in 1903 to become an assistant division engineer of the Michigan Central with headquarters at Jackson, Mich., and, in 1905, he was promoted to division engineer with headquarters at Niles, Mich. From 1907 to 1910 he was in charge of the grade separation work of the Michigan Central and the Chicago, Rock Island & Pacific, at Joliet, Ill. He was appointed division engineer at St. Thomas, Ont., in 1910, and was transferred to Detroit, Mich., in 1912. In 1914 he was promoted to engineer of track and maintenance of way and from 1917 to 1919 he acted as assistant chief engineer, with headquarters at Detroit, necessitated by J. F. Deimling, assistant chief engineer, becoming acting chief engineer during the absence of Colonel Webb in military service in France. He returned

G. H. Harris

to his former position in May, 1919, in which capacity he was serving at the time of his recent promotion.

James F. Deimling, assistant chief engineer of the Michigan Central, with headquarters at Detroit, Mich., has been promoted to chief engineer with the same headquarters, succeeding Col. Geo. H. Webb, whose death was noted in the *Railway Age* of November 12 (page 964). Mr. Deimling was born on November 18, 1867. He entered railroad service in March, 1886, as a rodman on the Missouri Pacific, which position he left in September of that year to become assistant engineer with the W. V. McCracken Construction Company. He re-entered railroad service in November, 1887, as assistant engineer of the Chicago & West Michigan, with headquarters at Grand Rapids, Mich., and in 1890 he was appointed assistant engineer of the Detroit & Lansing, which position he held until March, 1897, when he became engineer maintenance of way, of the Lake Superior & Ishpeming, and chief engineer of the Marquette & Southern. He entered the service of the Pere Marquette on June 1, 1904, and was, successively, track engineer with headquarters at Detroit, until July 1, 1905, and division engineer maintenance of way with headquarters at Grand Rapids, until February, 1906, at which time he was promoted to chief engineer with headquarters at Detroit. In October, 1912, he resigned to become engineer of construction of the Michigan Central, with headquarters at Detroit. In December, 1913, he was promoted to assistant chief engineer, which position he was holding at the time of his recent promotion. Mr. Deimling served as acting chief engineer from June, 1917, to May, 1919, during Colonel Webb's absence due to war service.

J. F. Deimling

Traffic

George F. Meighan has been appointed traffic manager of the St. Louis & Hannibal, with headquarters at Hannibal, Mo.

Charles Hamilton has been appointed district passenger agent of the Wabash, with headquarters at Philadelphia, Pa., effective November 15.

Charles W. Barber has been appointed general agent in the traffic department of the Akron, Canton & Youngstown, and the Northern Ohio railways, with headquarters at Pittsburgh, Pa.

S. R. Stevenson has been appointed general agent, freight department, of the Terminal Railroad Association of St. Louis and the St. Louis Merchants Bridge Terminal Railway, succeeding B. B. Hickman, promoted.

George Linn has been appointed grain agent of the New York Central (Buffalo and East) with headquarters at New York. He will also be responsible for the operation of the New York Central and West Shore grain elevators in New York Harbor, effective November 1.

Purchasing and Stores

S. J. DeGraeff has been appointed storekeeper of the Southern Pacific of Mexico with headquarters at Empalme, Sonora, Mexico.

F. G. Prest, purchasing agent of the Northern Pacific, with headquarters at St. Paul, Minn., has been made director of purchases, a newly created office, with the same headquarters, and R. J. Elliott, assistant purchasing agent with headquarters at St. Paul, Minn., will succeed Mr. Prest.

Obituary

H. J. Phelps, general passenger agent of the Illinois Central, with headquarters at Chicago, died at his home in that city on November 20.

Axel S. Vogt, formerly mechanical engineer of the Pennsylvania, Eastern lines, died on November 11 of heart disease. Mr. Vogt was born on January 19, 1849, at Christianstad, Sweden, and was educated in the public schools. He began railway work in June, 1874, with the Pennsylvania at Altoona and remained with that road until 1882, when he went with Schutte & Koehrting, Philadelphia, Pa. In November, 1883, he returned to the service of the Pennsylvania as assistant engineer of tests. On March 1, 1887, he was promoted to mechanical engineer, and remained in that position until February 1, 1919, when he retired. Since his retirement he was connected with the Baldwin Locomotive Works for a short time in an advisory capacity.

Axel S. Vogt

Edward A. Chenery, superintendent of telegraph of the Missouri Pacific, with headquarters at St. Louis, Mo., whose death was mentioned in the *Railway Age* of November 12 (page 964), was born on the Atlantic Ocean on October 17, 1859. He entered railroad service as a telegraph operator on the Grand Rapids & Indiana in November, 1872. He continued in that capacity until January, 1879, when he entered the service of the Galveston, Harrisburg & San Antonio, with which company he was successively telegraph operator, dispatcher, car accountant and secretary to the general superintendent. In June, 1886, he resigned to become secretary to the general superintendent of the Union Pacific, with headquarters at Omaha, Neb. The following year he became superintendent of telegraph of the Terminal Railroad Association and the St. Louis Merchants Bridge Terminal Railway, with headquarters at St. Louis. In May, 1903, he left the above companies to become superintendent of telegraph of the Missouri Pacific, which position he was holding at the time of his death. During the federal control of the roads, Mr. Chenery was general superintendent of telegraph of all the lines in the southwestern region with headquarters at St. Louis. For many years, Mr. Chenery was actively engaged in the work of the Association of Railway Telegraph Superintendents and served as its president during the year 1905-1906. Since the activities of this Association have been incorporated under the Telegraph and Telephone Section of the American Railway Association, he has been a member of the Committee of Direction.

Edward A. Chenery